

# ***CALIFORNIA ENVIRONMENTAL QUALITY ACT***

## ***SPECIAL INITIAL STUDY***

***For***

### ***Approval of a Hazardous Waste Facility Permit for Treatment and Storage of Hazardous Waste***

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*The Department of Toxic Substances Control (DTSC) has completed the following Special Initial Study for this project in accordance with the California Environmental Quality Act (' 21000 et seq., California Public Resources Code) and implementing Guidelines (' 15000 et seq., Title 14, California Code of Regulations). This Special Initial Study has also been used to satisfy the requirements of ' 711.4, Fish and Game Code and ' 753.5, Title 14, Code of California Regulations relating to filing of environmental fees.*

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#### ***I. PROJECT INFORMATION***

**Project Name:** Lawrence Livermore National Laboratory (LLNL)

**Site Location:** 7000 East Avenue, Livermore, CA 94550-9516

**Contact Person/ Address/ Phone Number:**

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#### **Project Description:**

The project consists of granting a permit to LLNL for the continued operation of existing units and the construction of new units for the purpose of storage and treatment of hazardous waste. Regulations governing the issuance of a Hazardous Waste Facility Permit (HWFP) to LLNL can be found in the California Code of Regulations, Title 22, Division 4.5, and the Health and Safety Code, Chapter 6.5. The units are described in detail in the Resource Conservation and Recovery Act (RCRA) Part B Application dated June 28, 1996.

## *Background*

Lawrence Livermore National Laboratory (LLNL) is located about 50 miles east of San Francisco at the southeast end of Livermore Valley in southern Alameda County, California. Figure 1 provides a regional location map of the LLNL main site. LLNL is composed of a main site, in Livermore, and Site 300, located approximately 15 miles southeast of the main site. For purposes of this Initial Study, Site 300 is not considered a part of the project description.

The LLNL main site covers 823 acres that was previously a U.S. Naval Air Station. LLNL was established in 1952 (then known as the University of California Radiation Laboratory, Livermore site). The facility is owned by the federal government and operated and managed by the University of California under a contract with DOE (the Atomic Energy Commission when the contract was entered into).

Land use around the site was once primarily agricultural, but now includes residential areas to the west and industrial parks to the north. Surrounding land uses include grazing, vineyards, residences, and industrial parks as shown in Figure 2. As a government property, LLNL is outside the jurisdiction of local planning agencies, however, the site is consistent with the existing land use plans and zoning policies of the City of Livermore and the County of Alameda's jurisdictions.

LLNL conducts research and development programs on nuclear weapons, magnetic fusion, energy, lasers, biomedical and environmental sciences, and applied energy technology. The activities on the site include numerous institutional support operations which supply security, occupational safety, employee health services, fire suppression, emergency response, facility and infrastructure maintenance and construction, environmental and public protection, and waste management. These research and development programs and support operations generate non-hazardous, hazardous, radioactive and mixed wastes.

Hazardous wastes, by definition, exhibit one or more of the following characteristics: ignitability, reactivity, corrosivity and/or toxicity, all as defined by Title 22, California Code of Regulations, Chapter 11. Mixed wastes have at least one of the above mentioned hazardous characteristics and also contain one or more radioactive materials regulated under the Atomic Energy Act (AEA). Each of the mixed wastes being generated and managed at the LLNL is classified as low-level radioactive waste that can be "contact handled" (i.e., can be handled without using remote-handling equipment).

LLNL stores and/or treats hazardous and mixed wastes generated by their main site and by operations at Site 300. The treatment and storage of mixed and hazardous waste is subject to state and federal hazardous waste laws. As such, a Hazardous Waste Facility Permit is required from DTSC, the agency with primary hazardous waste jurisdiction for California and the United States Environmental Protection Agency's (US EPA) authorized agency in California.

## *Interim Status Operation*

On November 12, 1980, LLNL submitted a Part A application for the operation of their hazardous waste management units. RCRA Interim Status and a DTSC Interim Status Document was granted to LLNL on May 16, 1983 which allowed continued operation of the units at their main site until a final permit determination could be made on their Part B Application. Changes to units under Interim Status were allowed through approval of a revised Part A application. Currently, authorized units are operating under a RCRA Part A permit application revised in 1996.

LLNL's current hazardous waste management facilities are shown in Figure 3 and consist of the following treatment and/or storage areas: Area 514, Area 612, Building 693, Building 233, and Building 419. Building 419 is undergoing RCRA closure. Building 233 and Area 514 will be closed as soon as permitted replacement units, Building 280 and Building 695 are constructed and operational. Area 612 and Building 693 will be permitted to continue to operate as part of the proposed facility described below.

LLNL main site is currently authorized under Interim Status to also accept off-site wastes generated at LLNL Site 300. No other off-site waste is accepted. Waste from Site 300 consists of a variety of wastes, mostly related to the formulation of explosives and maintenance of testing support systems. As a registered hazardous waste hauler, LLNL main site also acts as the transporter for shipments of wastes from Site 300 to the main site. Receipt of waste from Site 300 will be an authorized activity under the HWFP.

### *Proposed Facility*

Pursuant to the requirements of RCRA and the equivalent statutes of the California Health and Safety Code, LLNL has submitted a Part A and Part B application to obtain a permit for its Interim Status units with modifications and to construct a new unit, Building 695, which will house new equipment/areas to manage hazardous and mixed wastes.

If approved, the final permit would allow LLNL and the U.S. Department of Energy (DOE) to continue operating their existing container storage areas and treatment units at Area 612 and Building 693 and to modify an existing structure, Building 280, for use as a solid waste storage unit. The final permit would also allow LLNL and DOE to construct a replacement for their current liquid waste treatment facility at Area 514. The replacement units will be located in Building 695 which will be constructed as part of an area referred to as the Decontamination and Waste Treatment Facility Complex (DWTF). In the northeast corner of the complex, these areas/buildings are shown in Figure 4 and are described below. Within these areas/buildings, there will be a total of seventeen storage and sixteen treatment units.

Table 1 lists these areas along with a breakdown of the units contained within each area/building and the permitted capacities in the draft HWFP.

#### **1. Building 280 Container Storage Unit (B280 CSU)**

B280 CSU (Unit #1 of Table 1) is located near the center of the northeast quadrant of the site as shown in Figure 4. This building is the former containment building for a research

nuclear reactor known as the Livermore Pool Type Reactor, constructed in 1956 and used through the 1970s. It is a circular steel and concrete building 79 feet in diameter and 52.5 feet high with a domed roof structure. The reactor core has been removed, but the reactor's exterior structure will remain in the center of the building. A radiation survey was conducted in areas outside of the shielded enclosure containing the empty reactor vessel, measurements of surface radiation levels were taken, and swipes were taken on the floor and walls of the building and checked for radioactive surface contamination. No detectable radiation levels or surface contamination above background were detected. Results of on-going passive air monitoring conducted routinely inside B280 has shown levels at background. Based on the results of the radiation survey, it was concluded that B280 does not present a radioactive hazard to workers during hazardous waste operations. A new floor surface will be poured over the existing floor and equipped with an outer perimeter curb that will act as the containment berm system and an inner curb that will isolate the storage area from the central reactor structure. Only solid hazardous and mixed wastes will be stored at this facility. No external changes to the building or the surrounding area will be necessary to accommodate the new function of the building. The area around the building is paved and no additional paving of open ground is proposed. Building 280 will be permitted to store a maximum of 18,144 ft<sup>3</sup> (135,700 gal) of solid waste, equivalent to 162 - 4' x 4' x 7' storage boxes. Figure 5 shows a typical container arrangement for the Building 280 CSU.

## **2. Area 612 Container Storage/Treatment Unit Group (A612 CSTUG)**

The Area 612 CSTUG is an asphalt and concrete paved fenced complex located in the southeastern quadrant of the site, as shown in Figure 4. Eleven storage units and two treatment units (see Figure 6) are located in either open areas or buildings within the complex. These units are proposed for continued operation in the HWFP and are described below.

- ! **Area 612 Tank Trailer Storage Area** (Unit #2 of Table 1) is located in the north portion of the Area 612 Facility. It is an uncovered subgrade secondary containment area designed to store tank trailers (e.g., vacuum tankers) as well as portable tanks and containers on flatbed trailers. The unit can also be used as secondary containment for transportable treatment units (TTU) which are owned and operated by off-site contractors treating waste within the Area 612 CSTUG. The capacity for this unit will be 5,000 gallons.
  
- ! **Area 612 Portable Tank Storage Unit** (Unit #3 of Table 1) is located on the east side of the Area 612 CSTUG across from the Area 612 office (Trailer 6179). It is an uncovered 1,200 ft<sup>2</sup> concrete pad that is divided into two cells: Cell A on the west side of the unit occupies 480 ft<sup>2</sup> and Cell B on the east side occupies 720 ft<sup>2</sup>. The unit stores large containers, such as portable tanks. It will have a permitted capacity of 10,000 gallons, and the largest single container volume will be 660 gallons.

- ! **Building 612 Container Storage Unit** (Unit #4 of Table 1) is located within Rooms 100 and 110 (approximately 2,800 ft<sup>2</sup>) of Building 612 (see Figure 7). Waste is segregated within this unit using portable pallet-type secondary containment. It will have a permitted capacity of 7,150 gallons.
- ! **Building 612 Lab Packing/Packaging Container Storage Unit** (Unit #5 of Table 1) is located in Rooms 104, 105, and 107, which occupy an area of 275 ft<sup>2</sup>, 168 ft<sup>2</sup>, and 1,024 ft<sup>2</sup>, respectively (see Figure 7). Waste management in these rooms involve the repackaging of cans, vials, bottles and small containers of liquids and solids into overpacked 55-gallon drums. The unit includes the fume hood in Room 104 and a lip exhaust located at drum height installed in Room 105. Waste storage is limited to Room 107 while Rooms 104 and 105 are used for repackaging activities. The permitted storage capacity for Room 107 is 4,242 gallons. Room 107 will be reverting to generator status and close under RCRA standards when final closure of Building 612 is performed.
- ! **Building 612 Drum/Container Crushing Unit** (Unit #6 of Table 1) is located in the west portion of Room 100 (see Figure 7) within the secondary containment area of Building 612. This unit compacts empty, non-reusable drums and containers that formerly contained hazardous or mixed waste, laboratory solid debris, or non-regulated waste, thereby reducing them to a smaller size to facilitate packaging and consolidation for disposal. The sole component of the unit is a compactor that uses hydraulic force to flatten empty waste containers. Empty containers are placed into the steel cylindrical compaction chamber, which has a diameter of 32.5 in. and a height of 38.5 in. A 10- to 12-hp electrical motor then drives a piston pump at high pressure, which in turn forces a 6-in., cylindrical, chrome-polished, high-tensile piston with an attached head onto the container to be compacted. The unit is also equipped with a high-efficiency particulate air (HEPA) filtration system to capture airborne particulates. The cycle time of the compactor is 78 seconds.
- ! **Building 612 Size Reduction Unit** (Unit #7 of Table 1) is installed in the central portion of Room 100 of Building 612. The Size Reduction Unit is an enclosed stainless-steel walk-in booth that is 10 ft wide by 19.5 ft long, with a ceiling height of about 10 ft. The unit is also equipped with a HEPA filter system and a personnel airlock that allows personnel to don, change or remove personal protective equipment without spreading contamination outside the booth. Decontamination activities consist of high-pressure water blasting, abrasive blasting, washing and wiping. Large pieces of equipment are reduced in size by disassembling or cutting them into smaller pieces. The smaller pieces facilitates the decontamination of contaminated machinery and equipment and allows the most compact packaging for eventual disposal. Verification and inspection activities are also conducted in the booth and consists of opening drums, sampling, sorting and possible repackaging of the contents.

- ! **Area 612-1 Container Storage Unit** (Unit #8 of Table 1) is located on the west side of the facility, on the north side of the Area 612 office. The unit is a covered storage area consisting of two tents, Tent 6197 and Tent 6198, as well as an open, asphalt-surfaced storage area. This unit stores solid waste only and will be permitted to store a maximum of 38,400 ft<sup>3</sup> (287,944 gal).
- ! **Area 612-2 Container Storage Unit** (Unit #9 of Table 1) is located in the east side of the facility. The Area 612-2 Container Storage Unit is a 30-ft by 47-ft concrete pad surrounded by a 6 inch-high concrete berm. The steel-frame, open-sided structure is covered by a corrugated metal roof and screens are attached on four sides. The storage area is surrounded by a chain link fence with wooden slats. It will have a permitted capacity of 10,560 gallons.
- ! **Area 612-4 Receiving, Segregation, and Container Storage Unit** (Unit #10 of Table 1) is located in the southwest corner of the A612 CSTUG. The unit is a steel-frame structure with sheet metal interior and exterior walls and a diked, concrete floor slab covered by a corrugated metal roof. The interior of the unit is divided into five cells (Cells A, B, C, D, & E) by curbs. Cells A and E each occupy an area of 776 ft<sup>2</sup> and Cells B, C, and D each occupy any area of 740 ft<sup>2</sup>. A secondary containment system, a fire sprinkler system, and a sprinkler water retention system to collect discharged sprinkler water are installed in the unit. This unit is the main receiving area for hazardous wastes coming into the Area 612 yard. This area will have a capacity of 44,680 gallons and will be reverting to generator status and close under RCRA standards when final closure of Building 612 is performed.
- ! **Area 612-5 Container Storage Unit** (Unit #11 of Table 1) located in the southeast portion of the facility is a covered storage area consisting of one tent and four transportainers as well as an open, asphalt-surfaced storage area. The north and west sides of the unit have personnel and equipment access to manage, inspect, and maintain the containers. The unit manages solid wastes only and will be permitted to store a maximum of 26,870 ft<sup>3</sup> (200,990 gal).
- ! **Building 614 East Cells Container Storage Unit** (Unit #12 of Table 1) is located in the southeastern section of Area 612 CSTUG. This unit is a concrete-block, one-story structure that is divided into four 10-ft by 12-ft cells (i.e., rooms). Included as part of the container storage unit is a bermed, 40-ft by 32-ft concrete pad used for staging, repackaging, overpacking, lab packing, bulking, and blending. The unit will have a permitted storage capacity of 3,520 gallons.
- ! **Building 614 West Cells Container Storage Unit** (Unit #13 of Table 1) is immediately adjacent to the Building 614 East Cells Container Storage Unit. This unit is a one-story structure with concrete walls and floor and a reinforced concrete roof. The interior of the unit is divided into four 15-ft by 12-ft cells (i.e., rooms) where waste is segregated according to compatibility. The permitted capacity of the unit will be 672 gallons.

- ! **Building 625 Container Storage Unit** (Unit #14 of Table 1) is located on the northern end of Area 612. The unit is a steel-frame structure with corrugated metal sides and roof. The unit is divided into an east and west area, each occupying 2,400 ft<sup>2</sup> and separated by a concrete berm. It will have a permitted capacity of 42,416 gallons.

Certain areas of Area 612 are also used for the storage of low-level and transuranic (TRU) radioactive waste and are not regulated by DTSC. Much of this waste is "legacy" waste that must be characterized to more stringent acceptance criteria than what was previously acceptable for off-site disposal at DOE-approved radioactive and mixed waste disposal facilities. This characterization will be occurring over the next five to seven years. "Characterization" consists of the opening of storage containers (drums, bins, boxes, etc.) and the inspection, sampling and possible repackaging of the waste in order to satisfy transportation and disposal criteria. Mixed wastes and some low-level radioactive waste (LLRW) will be characterized in the Building 612 Size Reduction Booth. Non-hazardous low level and transuranic wastes will be characterized in Building 696, which will be constructed in the DWTF area. LLNL is not requesting authorization to use Building 696 for the storage or treatment of hazardous or mixed wastes at this time, although it has been considered as a future replacement building for the size reduction unit and drum crushing unit at Building 612.

### 3. **Building 693 Container Storage Unit Group (B693 CSUG)**

The B693 CSUG is located in the northeast quadrant of the site as shown in Figure 4 and is part of the DWTF. This unit group is comprised of four sub-units; Building 693 Container Storage Unit, Building 693 Annex, Building 693 Yard - Roll-off Bin Storage, and Building 693 Yard - Freezer Storage (see Figure 8). These sub-units are described below:

- ! **Building 693 Container Storage Unit** (Unit #15 of Table 1) is currently being operated as an Interim Status hazardous and mixed waste storage unit. The unit is divided into four cells each approximately 30 ft by 80 ft. It will be used to store solid, liquid and gaseous wastes. Other handling operations conducted in this unit include lab packing, overpacking, bulking, staging, sampling, and transferring. The unit will be permitted to store up to 141,240 gallons of waste.

- ! Building 693 Annex (Unit #16 of Table 1) - Classified Waste Storage will be a separate cell to be constructed on the northern end of Building 693 and used to store wastes that have been determined by the DOE to be classified due to shape, composition, or other reasons. The unit will be a structural steel frame building 20 ft wide by 60 ft long. Only solid waste will be stored in this unit and will be permitted to store up to 3,059 ft<sup>3</sup> (22,880 gal).
- ! Building 693 YardC Freezer Storage (Unit #17 of Table 1) will be a walk-in freezer that will be intermittently used to store wastes at a low temperature in order to reduce their reactivity prior to treatment. The freezer's outside dimensions are 10 ft wide by 12 ft long by 8 ft 3/4 in. high. Wastes in this unit will be stored in containers of 5 gallons or less. The freezer will be permitted to store up to 30 gallons of waste.
- ! Building 693 YardC Roll-off Bin Storage (Unit #18 of Table 1) will be a concrete bermed area that will be used for the storage of solid waste in two vendor-supplied 40 cubic yard solid waste roll-off bins. The bins will be lined with plastic and equipped with lids or tarps that can be secured when not open for putting waste in the bins. This unit will be permitted to store up to 2,165 ft<sup>3</sup> (16,200 gal). The bins will be shipped to commercial disposal facilities when they are full.

#### 4. Building 695 Storage/Treatment Unit Group (B695 STUG)

Building 695 will be constructed at the northeastern corner of the site next to Building 693 (see Figure 4) and is also part of the DWTF. It will consist of 12 treatment units and 2 storage units. The treatment devices are designed to treat waste in a more efficient manner than the existing liquid waste processing plant at Area 514 and will minimize the amount of waste residue to be disposed of after treatment. As shown in Figure 9, the Building 695 STUG will consist of the following hazardous waste management units:

- ! The Liquid Waste Processing (LWP) Area will be used for container storage and treatment. Most of the treatment equipment will be skid-mounted to allow the equipment to be moved so that the most efficient treatment trains will be utilized. The following treatment systems will be located within the LWP:
  - < A **Tank Farm** (Unit #19 of Table 1) consisting of nine 5,000 gallon storage/treatment tanks with chemical reagent feed and waste transfer systems will be constructed to perform neutralization, precipitation, adsorption, and other common wastewater treatment technologies.
  - < A **Tank Blending Unit** (Unit #20 of Table 1) would consist of a closed 100-gallon mixing vessel equipped with a reagent delivery system, pH and temperature monitors. This unit will be able to conduct basic wastewater treatment, but in smaller batches, typically less than 55 gallons. The tank blending unit would allow wastes that have special characteristics to be treated separately from larger batches of waste.

- < A **Portable Blending Unit** (Unit #21 of Table 1) would employ a blending container lid assembly, a chemical delivery system, controls and monitors, associated lines and piping, and pumps. The lid assembly is designed to fit 660 to 1,100-gallon stainless steel portable tanks storing liquid waste. This unit would allow waste to undergo the same treatment methodologies used at the tank farm on a smaller scale and without having to transfer the waste to another container.
- < A **Cold Vapor Evaporator** (Unit #22 of Table 1) would be used to treat waste waters that contain dissolved solids by evaporating the water off under low pressure and temperature, leaving the dissolved solids behind. The water vapor is condensed back into water that is free of dissolved solids. The unit can generate up to 300 gallons per hour of condensate.
- < A **Centrifuge** (Unit #23 of Table 1) will be used to separate multi-phase waste streams, such as a mixture of oil, water and debris, into their separate components. Each of the components can then be further treated (i.e., filtering, chemical treatment, etc.), recycled, or prepared for disposal. This unit would be able to process up to 2,000 liters per hour of waste.
- < The **Solidification System** (Unit #24 of Table 1) is an existing piece of equipment that is presently installed in Building 513 and will be transferred to the Building 695 LWP Area. The system consists of a fixed stand to support a double-planetary mixer, the hood that rests on the top of the drum, and the hydraulic piston that raises and lowers the hood/mixer assembly. A wheeled platform is also provided to allow one person to easily position a full drum within the mixing stand. To prevent movement during the mixing operation, the locking-brakes on the wheels are engaged and the drum is secured to the solidification system with a bracket. The hood provides both a water-tight and dust-tight seal that prevents liquid spillage or airborne releases into the workplace during mixing. The waste will normally be pumped or scooped from portable tanks or containers into 55-gallon drums which are solidified on a batch basis. After the solidification agent is thoroughly mixed into the waste, the drum is sealed, allowed to cure, and shipped off-site for disposal.
- < A **Shredder/Chopper** (Unit #25 of Table 1) will be installed to reduce the thickness of debris such as large metal, wood or plastic items, prior to solidification or debris washer treatment. Both pieces of equipment will use low-speed, high-torque cutting surfaces to size reduce the debris by ripping, shearing and tearing actions. The shredder will be able to process cloth, paper, cardboard, and other fibrous materials. The feed to the chopper will include harder materials such as thin gauge metal, wood, glass, and rubber.

- < A **Filtration Module** (Unit #26 of Table 1) will be replacing the filtration functions currently provided by the Dorr-Oliver rotatory vacuum filter located in Building 514. The Filtration Module will be used to remove solid contaminants (e.g., precipitates, suspended solids, or particulates) from wastewater so that the treated filtrate can be discharged to the sewer. The unit will consist of a 40-gallon per minute pump, a 100-gallon mixing vessel, and four filter stations. Various types of filter elements can be installed and changed depending on the desired filtration result. Typically, filter elements that rated for 25 microns or smaller will be used and may include, but not limited to polypropylene cartridge filters, adsorption cartridges consisting of activated carbon or clay-anthracite, cross flow membrane diffusion filters, cross flow nanofilters, and reverse osmosis membrane filters.
- < A **Drum Rinsing Station** (Unit #27 of Table 1) will replace the bulking station which is currently part of the Area 514 Waste Water Treatment Tank Farm Unit. The Drum Rinsing Station will be used to rinse empty containers. The unit will consist of a 400-gallon stainless steel reservoir and two high pressure wand-type sprayers. The rinsing solution will be typically water that may be heated. The unit is designed with two drum dumpers that hold the drums in a position such that the rinse water drains into the 400-gallon pan. The unit will require two hot water pressure washers and two drum lifters. The hot water will be supplied by a 120-gallon natural gas water heater. The rate of water consumption by the pressure washers is 3 gallons per minute and the delivery pressure of the water is between 1,500 and 3,000 psi.
- < The **Debris Washer** (Unit #28 of Table 1) will be a liquid extraction process that will consist of a washwater feed tank, a washing chamber, a heating/drying element, and associated pumps, pipes, and mixing equipment. The purpose of the Debris Washer is to remove hazardous and/or radioactive contaminants from debris to comply with LDR treatment standards. The debris will be treated in batches. Maximum batch size is expected to be approximately 180 lbs or 3 ft<sup>3</sup>. Contaminated debris will be cleaned by spraying and agitating with hot water, detergent, mild acid, mild base, or other water-based cleaning agent.
- < A **Carbon Adsorption System** (Unit #33 of Table 1) will primarily be used as an air pollution abatement device to treat off-gases from the Portable Blending Unit, the Tank Blending Unit, the Centrifuge and the Cold Vapor Evaporator. However, this system may occasionally be used to directly treat non-flammable waste gases as part of their small scale treatment activities. The system will consist of a compressed gas opening station, fume scrubber to neutralize acid gases, a mist eliminator, a heater and process air connection for dehumidification, a HEPA filter for particulate removal, a blower, and two carbon columns to adsorb volatile organics. The scrubber is designed to remove hydrochloric and nitric acids with a removal efficiency in excess of 90 percent by weight. The HEPA filter is designed to remove at least 99.97 percent by weight of particles that are 0.3 micron in diameter and larger. The carbon columns are designed with a volatile organic removal efficiency, based on trichloroethylene (TCE), in excess of 95 percent by weight.

- ! Building 695 Airlock (Unit #29 of Table 1) will be used for the storage of portable tanks and containers with sizes ranging between 330-1,150 gallons. This unit occupies a 1,560 ft<sup>2</sup> area and will be permitted to store a maximum of 12,000 gallons of waste.
- ! The Reactive Waste Processing (RWP) Area (Unit #32 of Table 1) will consist of various treatment and ancillary equipment and storage areas as described below:
  - < The **Pressure Reactor** (Unit #33 of Table 1) is an existing piece of bench scale equipment that is currently being used to conduct treatability studies. It is proposed that the pressure reactor be used for treating small quantities (approximately 750 ml or less) of waste that requires precise temperature and pressure controls to be maintained. These reactions include endothermic reactions that require precise heating to ensure that the desired reaction occurs; extremely exothermic reactions; and other unstable reactions that can generate explosive, high pressures, and/or toxic gases if the reaction rate or reaction conditions are not properly controlled. The pressure reactor has a total volume of 1 liter and is constructed of a nickel-chromium-molybdenum alloy that has the broadest general corrosion resistance of all commonly used alloys. The maximum operating pressure is 5,000 psi at a temperature of 500°C. The unit is mounted on a moveable floor stand and is powered by a 230 volt 50/60 Hz electrical supply.
  - < The **Water Reactor** (Unit #33 of Table 1) will be a new piece of bench-scale equipment that is an adaptation of the Pressure Reactor that will be used to treat only water-reactive waste such as metal hydrides, earth alkali metal hydrides, and carbides. The unit will be used to control the rate of reaction, dissipate exothermic heat generation, and to safely manage product off-gases. The unit will consist of a pressure reaction vessel, a system for introducing humid inert gas into the vessel, and, if needed, an off-gas treatment system. The reaction vessel will have a total volume of 1 liter and will be constructed of a nickel-chromium-molybdenum alloy that has the broadest general corrosion resistance of all commonly used alloys. The maximum operating pressure will be 5,000 psi at a temperature of 500°C. The unit will be mounted on a moveable floor stand and be powered by a 230 volt 50/60 Hz electrical supply.
  - < A **Reactive Materials Cell** (Unit #33 of Table 1) will be used for the uranium bleaching process which involves oxidizing uranium mill turnings to eliminate its pyrophoric properties. Equipment used for the process will consist of a chemical reagent mixing/feed tank, a reaction vessel, heat exchanger, inert gas supply, and associated pumps and pipes. The reaction vessel will have an internal volume of 7.5 ft<sup>3</sup> and the mixing/feed vessel will have a minimum capacity of 150 gallons.
  - < A **Reactive Waste Storage Unit** (Unit #30 of Table 1) will be constructed and used for the storage of reactive wastes. The room will consist of four cells each having a width of 17 feet 5 inches and a length of 11 feet. This unit will have a total permitted storage capacity of 12,400 gallons.

- < Four glove boxes will be installed in the RWP area to provide containment and ventilation controls for treatment conducted in the Pressure Reactor and the Water Reactor and other small scale treatment processes. The glove boxes consists of a Radioisotope Glove Box for handling wastes that contain radioisotopes that may be dispersible; a Perchloric Acid Fume Hood for handling acids that need special ventilation, such as fuming acids; and an Inert Atmosphere Glove Box for handling air or water-reactive compounds, and a Combined Hazardous Glove Box for waste that exhibit hazards that do not fit into the above categories.
- ! A **Small Scale Treatment Laboratory** (Unit #33 of Table 1) will occupy an 808 ft<sup>2</sup> area and be used to conduct small-scale "benchtop" treatment activities of specialized small quantity waste streams that cannot be blended with other wastes to make batches large enough to treat in the LWP Area. Similar to treatability studies, the maximum amount of waste that can be treated per day is 250 kilograms (this amount includes the waste treated in the pressure reactor, water reactor and reactive materials cell). Treatability studies may also be conducted in this laboratory. The treatment activities conducted here will be limited to the technologies used in the LWP Area; additional treatments may be conducted with prior notification of DTSC, similar to the treatability studies process.

A **Mercury Amalgamation Process** (Unit #33 of Table 1) will be conducted in the Small Scale Treatment Laboratory to treat small quantities of mercury waste. The amalgamation will be conducted within laboratory glassware or metal containers. The treatment process will take place under a laboratory hood or within an inert atmosphere glove box.
- ! The **DWTF Portable Tank Storage Pad** (Unit #31 of Table 1) is an outdoor concrete containment area that will be constructed and used to stage liquid waste in portable tanks prior to treatment in the LWP Area. The pad is rectangular in shape with a width of 68.67 ft and a length of 59.33 ft. It will be permitted to store a maximum of 22,000 gallons.

The construction of the DWTF will require grading for the installation of building foundations, underground utilities, and underground retention tanks. The DWTF yard area will be paved with asphalt. Building foundations and secondary containment areas will be poured reinforced concrete.

Other buildings being constructed as part of the DWTF include Building 694, Building 696, and Building 698. Building 694 will contain operational support offices. Activities in Building 696 will consist of radioactive waste classification, treatment and storage. Building 698 will be called the Chemical Exchange Warehouse and be used as a clearinghouse for surplus chemicals and products that are still useful. Since these buildings will not conduct hazardous waste activities requiring a permit, they are not included as part of the project analyzed in this Initial Study.

The A514 Facility and the B233 Container Storage Area will be deactivated as the DWTF and B280 facilities come on line. Since the activities in B695 will basically replace the activities currently conducted in A514, LLNL has developed a transition plan to avoid shutting down waste management operations. The transition schedule will involve phases in which some equipment will be relocated from A514 to Building 695, newly installed equipment in Building 695 will undergo a trial operational period, old equipment in A514 will be shut down, operations at Building 695 will begin and immediately be followed by closure of the entire A514 Facility. During the transition, the total aggregate storage capacity specified in the HWFP for all hazardous waste management facilities will not be exceeded. Further, the A514 Facility container storage units will not exceed their interim storage capacities. While A514 equipment are being relocated to the DWTF, operations at any older units will remain within interim status daily design capacities. If a comparable unit is operating at the DWTF at the same time, total treatment capacities for both units will not exceed the annual treatment capacity found in the HWFP. Table 1 indicates the status of all units associated with the project after the permit decision. LLNL is required to submit closure plans for the Area 514 Facility and Building 233 to DTSC for approval of closure activities. The closure activities will consist of the decontamination of the equipment and buildings, removal of certain equipment, and the sampling of soil, surfaces, and objects that have been in contact with hazardous waste or have potentially become contaminated. It will also include the decontamination of equipment used in the closure activities as well as the deposition of the wastes generated by the closure. Impacts of these closure activities will be evaluated under a separate CEQA document when more details are available regarding final closure.

#### **Agencies Having Jurisdiction Over the Project / Types of Permits Required:**

Department of Toxic Substances Control / Hazardous Waste Facility Permit  
Bay Area Air Quality Management District / Permit to Operate

#### ***II. DISCRETIONARY APPROVAL ACTION BEING CONSIDERED BY DTSC***

: Initial Permit Issuance	9 Removal Action Plan
9 Permit Renewal	9 Removal Action Workplan
9 Permit Modification	9 Interim Removal
9 Closure Plan	9 Other (Specify)
9 Regulations	_____

**Program / Region Approving Project:**

California Environmental Protection Agency  
Department of Toxic Substances Control  
Berkeley Office  
Facility Permitting Branch

**Contact Person / Address / Phone Number:**

James Stettler  
Department of Toxic Substances Control  
700 Heinz Blvd, Suite 200  
Berkeley, California 94710-2737  
(510) 540-3936

***III. ENVIRONMENTAL CONDITIONS POTENTIALLY AFFECTED***

The boxes checked below identify environmental factors which were found in the following ENVIRONMENTAL SETTING/IMPACT ANALYSIS section to be potentially affected by this project, involving at least one impact that is "Potentially Significant" or "Potentially Significant Unless Mitigated".

<input type="checkbox"/> Earth	<input type="checkbox"/> Risk of Upset	<input type="checkbox"/> Aesthetics
<input type="checkbox"/> Air	<input type="checkbox"/> Transportation/ Circulation	<input type="checkbox"/> Cultural/ Paleontological Resources
<input type="checkbox"/> Surface and Groundwater	<input type="checkbox"/> Public Services	
<input type="checkbox"/> Plant Life	<input type="checkbox"/> Energy	<input type="checkbox"/> Cumulative Effects
<input type="checkbox"/> Animal Life	<input type="checkbox"/> Utilities	<input type="checkbox"/> Population
<input type="checkbox"/> Land Use	<input type="checkbox"/> Noise	<input type="checkbox"/> Housing
<input type="checkbox"/> Natural Resources	<input type="checkbox"/> Public Health and Safety	<input type="checkbox"/> Recreation

#### ***IV. ENVIRONMENTAL SETTING/ IMPACT ANALYSIS***

The following pages provide a brief description of the physical environmental conditions which exist within the area affected by the proposed project and an analysis of whether or not those conditions will be potentially impacted by the proposed project. Preparation of the Environmental Setting and Impact Analysis sections follows guidance provided in DTSC's *Workbook for Conducting Initial Studies Under the California Environmental Quality Act* (CEQA), October 1996 (Workbook).

This Special Initial Study also supports the claim that there is no evidence before DTSC that this project will have potential for an adverse effect on fish or wildlife or the habitat that on which the fish or wildlife depends pursuant to the provisions of Title 14, CCR ' 753.5 (d). A list of references used to support the following discussion and analysis are contained in Attachment A and are referenced within each environmental factor discussed below.

Mitigation measures which are made a part of the project (e.g: permit condition) or which are required under a separate Mitigation Monitoring Plan which either avoid or reduce impacts to a level of insignificance are identified in the analysis within each environmental factor.

## 1. Earth

### Description of Environmental Setting:

#### *Topography*

The LLNL Livermore site is located in the southeastern portion of the Livermore Valley. The valley forms an irregularly shaped lowland area about 16 miles long east-to-west and 7 to 10 miles wide north-to-south. The floor of the valley slopes to the west at about 20 feet per mile. (US DOE & UC, 1992, p. 4-69)

In general, the LLNL Livermore site is located on relatively flat foothills that have low relief and slope gently northwest and north. Slopes at the LLNL Livermore site do not generally exceed a 1-degree inclination. The LLNL Livermore site property ranges in elevation from 676 ft (206 m) in the southeast corner to 571 ft (174 m) in the northwest corner. (US DOE & UC, 1992, p. 4-69)

#### *Stratigraphy*

The sediments beneath the Livermore Valley range in age from Jurassic to Quaternary. A large volume of the valley sediment is composed of late Tertiary and Quaternary alluvial sediments known as the Livermore Formation. The maximum thickness of the Livermore Formation is thought to be approximately 4,000 ft (1,219 m). This formation has been divided into Upper and Lower Members. The Upper Member of the Livermore Formation is characterized by massive gravel beds mixed with sand, silt, and clay. The Lower Member of the Livermore Formation is dominated by greenish to bluish-grey silt and clay, with lenses of gravel and sand. (US DOE & UC, 1992, p. 4-75)

#### *Soils*

The soils in the Livermore Valley beneath the LLNL Livermore site are formed primarily upon sediments deposited by local streams. Most of the deposits in the eastern part of the valley are relatively young, and thus soils are only moderately developed. These soils have minimal horizon or development of layers, and can be locally several meters thick. The soils are used for crop production when provided with sufficient water and nutrients or minerals. Four soils cover most of the LLNL Livermore site vicinity. In order of decreasing extent they are: Rincon loam, Zamora silty clay loam, Positas gravelly loam, and Rincon clay loam. These soils are primarily Alfisols, or moderately developed soils, and grade into Mollisols, which are grassland soils (US DOE & UC, 1992, p. 4-77).

Some soils under the LLNL site have been degraded by a variety of volatile organic compounds (VOCs), gasoline, chromium and tritium. In 1987, LLNL was identified as a Superfund site under federal environmental site clean up statutes: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and, the Superfund Amendments and Reauthorization Act (SARA). LLNL completed an investigation, a Baseline Public Health Risk

Assessment, a Feasibility Study, a Proposed Remedial Action Plan, and a Remedial Action Implementation Plan in order to remediate these soils. A Record of Decision (ROD), which identifies the approved remedy and schedule of implementation for remediation, was issued in 1992. Sixty percent of the plan has been implemented.

Much of the contamination occurred over the course of the years before strict federal and state hazardous waste management laws were enacted. Even if remediation of contaminated soils were not ongoing and continued degradation of the groundwater occurred, the estimated time frame for contamination to reach the closest municipal supply well would be about 270 years (US DOE & UC, 1992, p. 4-386). However, through implementation of the ROD, remediation action has begun and will continue.

None of the contaminated areas (except tritium found in the groundwater) involve mixed waste. The ROD specified eight treatment facilities to be installed and operated. All but one of these treatment facilities have been implemented and are operational. These facilities provide the technologies necessary to strip contamination from the soils. Current stringent laws and proper management provide an environmental framework to prevent further contamination of soils and aquifers.

#### *Plant, Fish and Wildlife Habitat*

See item #4 and #5 of this Initial Study for a description of plant and animal life at the site.

#### *Seismic Hazards*

The LLNL Livermore site is located in a region that has experienced earthquakes. Active faults within 50 miles that are capable of causing strong ground motion at the Livermore site include the San Andreas, Hayward, Calaveras, Concord-Green Valley, Greenville, and Las Positas-Veronal Faults and potentially the Rogers Creek and the Corral Hollow-Carnegie Faults (Part B, 1996, Vol. 1, Part II, p. 9). The north branch of the Las Positas Fault is the closest fault to LLNL's hazardous waste management facilities. The Las Positas Fault is approximately 600 feet south of the Area 612 Facility, 2,700 ft south of the DWTF and 6,000 ft southeast of the Building 280 Facility. The Area 612 Facility, the DWTF, and the Building 280 Facility are approximately 4,600, 3,500, and 4,900 ft west, respectively, from the nearest potentially active fault strands in the Greenville Fault zone (Towse & Carpenter, 1986).

#### *Analysis of Potential Impacts:*

The project will not result in the creation of slopes or cuts that could form unstable earth conditions because the excavation necessary for the project will not significantly affect the surface contour. The excavation and preparation of the site for the building foundations and paving will result in displacement and compacting of the soil. The DWTF will result in the covering of an area of approximately 240,000 square feet (400 feet by 600 feet) with buildings and paving. Since the soil in this area has been highly disturbed by farming and the subsequent use of the area by the military and by LLNL, and the surface area of the project is relatively

small compared to the open space in the vicinity, the disruption and overcovering of soil will not lead to significant changes in groundwater recharge or runoff volumes.

The construction phase of the project will be finite and erosion resulting from the action of wind and water on disturbed soil will be minimal. Since the project site will be paved, rainwater runoff will be increased, but it will be routed to the LLNL storm water system. There are no known geologic resources (aggregates, clay, coal, minerals, and fossils) that would be adversely impacted by the hazardous waste storage and treatment activities. None of the proposed activities are near, or on, any known or exploitable mineral resources, fossil beds, unique geologic outcrops, or other unique geologic features; nor would there be an adverse impact on farming or grazing activities. In addition, the work would occur well outside of the Arroyo Las Positas and Arroyo Seco and would not impact any riparian areas or wetlands.

The wildlife diversity at the LLNL site is low because of the highly altered nature of the site. The proposed project would include building construction and upgrading of existing buildings. These activities would disturb soil in areas that do not support wildlife, in areas that support wildlife typical of built-up areas, or in areas that support species typical of early successional habitats. Therefore, no adverse effects to wildlife resources are expected since all of the activities occur in developed areas that do not contain important wildlife habitat. Similarly, these activities would take place on land that currently does not support vegetation, has been landscaped, or supports an early successional plant community indicative of recent land disturbances. Therefore, no adverse effects on vegetation are expected.

The project is not expected to expose people or property to earthquake faults since the proposed hazardous waste management areas are more than 200 feet from any fault which has experienced activity within the Holocene Era and, therefore, meet the seismic standards set forth in the California Code of Regulations, Title 22, Section 66270.14(11). An evaluation was conducted on the design of Building 280, Buildings 612, 612-2, 612-4, 614 and 625 within the Area 612 Facility and Buildings 693 and 695 within the DWTF to determine compliance with current Uniform Building Code (UBC) seismic requirements. All buildings were found to either meet or exceed the 1994 UBC seismic requirements which is the current standard for concrete and steel structures.

The expected year of closure of the Area 612 CSTUG, the DWTF, and Building 280 Container Storage Unit is 2030. At that time, disruption of soil may occur due to sampling activities and the removal of structures, if necessary. However, since soil in these areas have already been highly disturbed, such temporary closure activities would not pose a significant impact and if structures are removed, the area would be returned to its original state.

Closure activities related to the project that may also affect earth are the closures of Building 233 and Area 514 which will consist of drilling holes to collect soil samples under buildings and containment areas. The HWFP requires LLNL to submit the closure plans for Area 514 and Building 233 within 180 days of its effective date. Impacts to earth from the activities described in the closure plans will be analyzed in a separate CEQA document to be prepared as part of the review of the closure plans. Upon DTSC's authorization for LLNL to

operate B280 CSU and the newly constructed permitted portions of the DWTF, LLNL will implement closure of Area 514 and Building 233 in accordance with the approved closure plans.

As a result of soil contamination found under the LLNL site, it has been identified as a Superfund site under CERCLA and remediation is currently being conducted. However, groundwater monitoring data from wells in the vicinity of the DWTF shows that the soils at the DWTF are not contributing to groundwater contamination. Therefore, the disruption of soil as a result of the project would not disturb or expose people to contaminated soil.

*Findings:*

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Less Than Significant Impact</i>	<i>No Impact</i>
9	9	:	9

## 2. Air

*Description of Environmental Setting:*

The Livermore Valley is characterized by mild, rainy winters and warm, dry summers. The mean annual temperature for the 30-year period from 1950 through 1980 was 58.1° Fahrenheit (F) with daily extremes of 18°F to 113°F. Both rainfall and wind exhibit strong seasonal patterns. Most of the annual rainfall, which averages 14 inches, occurs between October and April and is associated with migratory, low-pressure systems from the Gulf of Alaska. Prevailing winds are from the west and southwest from April through September. During the wet season, northeasterly and north-northeasterly winds that are associated with post-frontal, anti-cyclonic flow are also common. (US DOE, 1996, p. 22)

The types of pollutants considered in this Initial Study are those regulated by federal, state, and local air pollution agencies. The pollutants are typically categorized as follows:

- ! Criteria pollutants - consisting of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter and lead and various permitting processes for sources that could emit or contribute to the formation of these chemicals in the ambient air are regulated through the National Ambient Air Quality Standards (NAAQS);
- ! Toxic air contaminants (TAC) such as benzene, chlorine, flouorocarbons, toluene, etc., are primarily regulated at this time through state laws such as the California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) and Assembly Bill 1807, the Tanner Act.

! Hazardous air pollutants such as asbestos, beryllium, mercury, vinyl chloride, benzene, radionuclides, and lead are regulated under the National Emissions Standards for Hazardous Air Pollutants (NESHAP); and

#### *Criteria Pollutants*

The Bay Area Air Quality Management District (BAAQMD) is the regional, government agency that regulates sources of air pollution within the nine San Francisco Bay Area Counties. BAAQMD's jurisdiction includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. BAAQMD has established several air monitoring stations within these counties that monitor the following criteria pollutants: Ozone(O<sub>3</sub>), Carbon Monoxide (CO), Nitrogen Dioxide (NO<sub>2</sub>), Sulfur Dioxide (SO<sub>2</sub>), and Suspended Particulate Matter less than 10 microns(PM<sub>10</sub>). Air pollution data from the monitoring stations are used by BAAQMD to determine its compliance with federal and state standards set for O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub> and PM<sub>10</sub>. In 1996, the BAAQMD monitoring station in Livermore revealed that the state ozone standard was exceeded 22 days out of the year and the federal ozone standard was exceeded 8 days out of the year. In addition, the state PM<sub>10</sub> standard was exceeded 1 day out of the year but never exceeded the federal standard in that same year. For State air quality planning purposes, the Bay Area is classified by the California Clean Air Act (CCAA) as "serious" non-attainment area for ozone. The serious classification triggers BAAQMD to update its Clean Air Plan (CAP) every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emissions inventory data. BAAQMD is currently in the process of updating its 1994 CAP. The 1997 CAP proposes to revise and add new control measures that would help improve air quality in the Bay Area, reduce transport emissions and help improve air quality in neighboring air basins.

#### *Toxic Air Contaminants*

In addition to criteria pollutants, airborne contaminants from toxic substances which are referred to as Toxic Air Contaminants (TACs) are also regulated by the BAAQMD. However, no specific air quality standards have been established for these pollutants. Instead, facilities are required (under AB 2588) to submit to the local air districts an air toxics emissions inventory. After the local air district receives completed inventories, it is required to identify high-priority facilities that must prepare facility-wide health risk assessments. Based on the emission inventory information submitted by LLNL, the BAAQMD determined that projected emissions required a risk assessment. The air district evaluated the risk of LLNL's emissions cumulatively with other projects in the vicinity and found the risk to be acceptable (BAAQMD, 1991, p. 9).

#### *Hazardous Air Pollutants*

Radionuclides, mercury, and beryllium are potential sources of air contaminants which are not regulated by BAAQMD but are regulated at the federal level by the National Emissions Standards for Hazardous Air Pollutants (NESHAP). These federal standards establish annual reporting requirements for facilities that emit radionuclides and limit the radiation dose to a member of the public to no greater than 0.01 rem (10 mrem) per year effective dose equivalent.

LLNL complies with NESHAP by conducting monitoring for radioactive releases and preparing an annual report according to NESHAP standards. LLNL also conducts ambient air monitoring for beryllium. The BAAQMD standard for an ambient monthly maximum concentration for beryllium is  $0.01 \mu\text{g}/\text{m}^3$ . LLNL does not monitor for mercury since there are no applicable mercury standards for any LLNL operations in which mercury is used.

The mixed waste (contains waste with both radioactive and hazardous waste properties) handled in the units are classified as "low-level" waste. Low-level waste is defined by DOE order 5820.2A as a waste containing radioactivity not classified as high-level waste, transuranic waste, spent nuclear fuel, or specified byproduct. Most low-level waste consists of relatively large amounts of waste materials contaminated with small amounts of radionuclides, such as rinsewater, contaminated equipment, protective clothing, paper rags, packing material, and solidified sludges. Low-level waste is further categorized as contact handled or remote handled and as alpha or non-alpha on the basis of the types and levels of radioactive emissions. However, most low-level waste can be handled without additional shielding or remote handling equipment.

#### Analysis of Potential Impacts:

##### *Potential Sources of Air Emissions*

The Health Risk Assessment (LLNL, HRA, ;1997) prepared for the project identified that the main sources of emissions would come from the Building 695 STUG and the A612 CSTUG.

Building 280 CSU, Building 693 CSUG, Area 612 storage areas and Building 695 Airlock, Reactive Waste Storage Rooms, and Portable Tank Storage Pad were not considered sources of emissions since they are primarily used for waste storage. Emissions from these buildings/areas are minimized by keeping containers closed except when adding or removing waste (as in sampling, transferring, bulking, repackaging, or lab-packing operations). Bungs are tightened and rings are bolted; can lids are shut; valves on tank trailers and portable tanks are kept shut; and boxes are crimped, clamped, stapled, or nailed shut. Portable tank and truck tanker lids/access ways are screwed tight or clamped down. Also quick disconnects on tank trailers and portable tanks are capped when not in use. In addition, the HWFP requires LLNL to comply with Subpart CC which requires openings on containers greater than 119 gallons in size to be covered so that there are no detectable emissions. Should a container with a capacity of 119 gallons or greater require venting of off-gases during storage, the venting system of the container must be fitted with a carbon adsorption device to capture emissions. Based on the above management practices and permit requirements, waste container storage units are not considered significant sources of air emissions (LLNL, HRA, 1997, pp. II-4 to II-5).

Transfer operations and the SRU located within A612 CSTUG were considered emissions sources. The A612 CSTUG is primarily used to store and process solid waste, but limited liquid waste storage and bulking will also be conducted. Transfer operations that may result in emission of volatile compounds and radionuclides include consolidation of two or more containers into a single, common container or transfer of waste from containers and portable

tanks into a tanker via a vacuum suction line on the tanker or by an external pump with a submerged-fill discharge into the tanker. The Size Reduction Unit consists of a stainless steel walk-in booth with a HEPA-filtered ventilation system. This unit is considered an emission source of small-diameter particulates, radionuclides, and volatile compounds. (LLNL, HRA, 1997, pp. II-7 to II-8)

Building 695 consists of storage and treatment units that may handle liquid, solid, and gaseous waste. Localized air abatement systems will be provided for a majority of the treatment systems (i.e. Tank Farm, Tank and Portable Blending Units, Cold Vapor Evaporator, Centrifuge, Filtration Module, Shredder and Chopper, Debris Washer, Solidification System, Uranium Bleaching System, the Pressure and Water Reactor) to remove hazardous constituents from the process off-gases. In general, the air abatement system will consist of a HEPA filter, a heater, carbon adsorption columns, and a variable speed blower that would capture particulates, radionuclides, and volatile organic compounds. Estimated emissions from the above units took into account an efficiency of 95% for the carbon adsorption system and an efficiency of 99% for the HEPA filters.

#### *Emission Estimates*

Based on all the emission sources identified above, emission rates of criteria pollutants from the project were estimated and compared to existing sitewide emissions and to emissions measured for Alameda County and the San Francisco Bay Area Basin. Although Table 2 indicates that the project would generate carbon monoxide and nitrogen dioxide, the source of these pollutants is not from the hazardous waste management units but from the boiler supplying hot water to the DWTF. The values for PM<sub>10</sub> and Precursor Organic Compounds are assumed to be upper bound estimates based on the assumption of 100% volatilization of most volatile organic compounds and minimum efficiencies of abatement systems (i.e., a 99% HEPA filter efficiency was used instead of 99.97%). Background concentrations for Alameda County and the San Francisco Bay Area Basin were calculated by BAAQMD using data from stationary and mobile sources.

As shown in Table 2, the estimated criteria pollutant emissions from the project is negligible compared to LLNL's sitewide emissions for the years 1995 and 1996 and would not contribute to the background concentrations for Alameda County or the San Francisco Bay Area Basin. Therefore, the predicted emissions of criteria pollutants from the project is not expected to substantially contribute to existing or new BAAQMD violations of state or federal air quality standards.

#### *Air District Permit Requirements*

BAAQMD's permitting process is the district's method of controlling air emissions which may contribute to violations of air quality standards. It is based on the premise that the operation or equipment that is granted a permit or exemption is within BAAQMD's performance standards. The BAAQMD standards are based on best present day industry practices and on cost and benefit ratio. If the equipment to be permitted or exempted does not conform to the BAAQMD rules and regulations, then the unit cannot be operated until it complies with BAAQMD rules

and regulations. Rules applying to various equipment or operations are adopted by the BAAQMD as part of a plan to meet state and federal air quality standards. Facilities utilizing equipment that might violate air rules and regulations must obtain a Permit to Operate. Only certain emission sources identified in the project are subject to BAAQMD requirements. For example, all the storage units proposed in the project are not regulated by BAAQMD because they are not considered emission sources. The Building 612 Drum Crusher is allowed to operate pursuant to BAAQMD Permit #5949 and the 1,050-gal and 5,500-gal vacuum tankers and 6 portable tanks are managed under BAAQMD Permit #17010. LLNL is currently waiting for BAAQMD's concurrence that the Tank Farm is exempt under District Regulation #2-1-123.2 and that the remaining treatment units in the Building 695 STUG are exempt under District Regulation #2-1-103.

### *NESHAP Requirements*

Radionuclides, mercury, and beryllium are potential sources of air contaminants which are not regulated by BAAQMD but are regulated under NESHAP. Table 3 shows the predicted emission rates of hazardous air pollutants from the project compared to sitewide emissions and applicable NESHAP standards. Radionuclide data from 1990 to 1997 shows that the annual effective dose monitored at the site has remained well below the regulatory standard of 10 mrem/yr. Adding the estimated radionuclide emissions from the project to the 1996 site data would result in a total of 0.18 mrem/yr which would still remain well below the regulatory standard. As for mercury, the emission standards established by EPA apply only to mercury ore facilities, mercury cell chlor-alkali plants, sludge incineration plants and sludge drying plants. Since no standard has been established for mercury emissions from an amalgamation process as proposed under the project, the emission standard of 2300 grams per 24-hour period for mercury ore processing facilities was used for comparison purposes. Based on this comparison, the predicted emission rate for mercury is considered to have a negligible impact on air quality. Finally, Table 3 shows that the project would also contribute a negligible increase to LLNL's existing beryllium emissions which is already 230 times below the EPA standard. Therefore, hazardous air pollutants are not expected to pose a significant impact to air quality.

However, for compliance with NESHAP reporting requirements, LLNL will conduct continuous monitoring of radioactive releases from the DWTF stack which would be evaluated in conjunction with Building 280, Area 612 and other existing hazardous waste management facilities and practices at the site to ensure that radionuclide emissions do not exceed an annual effective dose of 10 mrem to any member of the public. Alpha, beta, gamma, neutron and carbon 14 concentrations are also monitored.

### *Other Potential Impacts*

Potential cancer and non-cancer risks from emissions of radionuclides and toxic air contaminants are evaluated under item #14, Public Health and Safety, of this Initial Study,. Air emissions as a result of normal operations were found to be within acceptable levels.

Information gathered over several years indicates that species diversity has not been negatively affected by site operations. No significant deterioration of habitats, species diversity or numbers has been noted in numerous field studies. Based on this information, the Health Risk Assessment concluded that ongoing operations have and do not appear to have significant or measurable adverse effect on local ecological resources. The emissions estimates above have also shown that no degradation of air resources are expected. Therefore, the project's air emissions will not cause any adverse change to ecological resources.

Construction-related air impacts associated with the proposed action would include an increase in fugitive dust. Fugitive dust emissions would be mitigated by water spraying of roads and exposed piles of excavated materials.

Off-site odor is not expected to be significant because containers used for storage are kept closed and tanks used for storage and/or treatment are close-top tanks. In addition, carbon adsorption units used in areas where emissions are expected would further control the release of odorous compounds to a less than significant level.

Regarding the shipment of wastes off-site, protection against releases is provided by the original containerization and the labpacking that takes place prior to storage. Drums are Department of Transportation (DOT) approved that are sealed shut during storage, and are essentially air-tight, minimizing any releases to air. Transportation packaging requirements and control measures to limit emissions of radiation are discussed in item #9 of this Initial Study, Transportation/Circulation.

Based on the above analysis, any impacts to air quality will be less than significant.

### Findings:

	<i>Potentially</i>		
<i>Potentially</i>	<i>Significant</i>	<i>Less Than</i>	
<i>Significant</i>	<i>Unless</i>	<i>Significant</i>	<i>No</i>
<i>Impact Mitigated</i>	<i>Impact</i>	<i>Impact</i>	
9	9	:	9

### **3. Surface and Ground Water**

#### *Description of Environmental Setting:*

##### *Surface Water*

The LLNL Livermore site is located at the eastern end of the Livermore Valley ground water basin. Recharge to the basin is largely from arroyos originating in the foothills, including Arroyo Seco and Arroyo Las Positas, both of which cross the LLNL Livermore site.

The major surface drainages in the Livermore Valley are the Arroyo Seco, Arroyo Las Positas, Arroyo Mocho, and Altamont Creek. These surface streams are all intermittent and flow generally to the west. Only Arroyo Las Positas and Arroyo Seco cross the Livermore site. Arroyo Seco crosses the southwest corner of the site and receives a minor amount of Livermore site runoff. The Arroyo Las Positas channel has been rerouted to run in a northerly direction along the east site boundary then west along the north site boundary. Arroyo Las Positas receives the majority of the Livermore site runoff. (US DOE & UC, 1992, pp. 4-146 to 4-148). The Arroyo Las Positas and Arroyo Seco are dry year round at LLNL, except immediately after a storm even or after the release of certain non-storm water discharges.

Storm water on the Livermore site is channeled through storm drains and open ditches designed to accommodate a 10-year storm event. Some surface water is directed through storm channels into the excavated, 4-acre drainage retention basin in the central portion of the site.

Surface water bodies near the site include the South Bay Aqueduct, treatment tanks and the reservoir of the Patterson Pass water treatment facility, Lake del Valle, Lake Isabel, and the lake at Shadow Cliffs Regional Park. None of these drain through or receive flow from the LLNL site.

Permits have been issued for wastewater discharge to the sanitary sewer, and stormwater to the Arroyo Las Positas and Arroyo Seco. The permit issued by the City of Livermore Water Reclamation Plant provides limits for wastewater discharges to the sanitary sewer. Waste discharge requirements for stormwater discharged to surface waters have been issued by the San Francisco Bay Regional Water Quality Control Board.

##### *Groundwater*

Groundwater flow is generally westward. Depth to groundwater varies from about 110 feet in the southeast corner to 30 feet in the northwest corner. Sources of groundwater recharges within the Livermore Valley basin are stream runoff, precipitation, controlled releases from the South Bay Aqueduct, and waters from domestic and agricultural irrigation.

Groundwater beneath the eastern Livermore Valley has generally been rising because there has been a decrease in volume of groundwater pumped for agricultural uses and by LLNL over the past 20 years.

Contaminants from 17 soil and sediment contamination areas investigated at LLNL contribute to groundwater contamination at the site. The contamination is a result of prior operations and is not attributed to any existing hazardous waste management operations at the site. The majority of the contamination has been found in the southwest and southeast quadrants of the LLNL site. Contamination at the sites include: metals (including chromium and cadmium), VOCs (including trichloroethylene, perchloroethylene, and chloroform). The LLNL site was identified as a Superfund site under CERCLA/SARA and was placed on the National Priorities List in 1987.

A Record of Decision, issued in 1992, and the Remedial Action Implementation Plan, issued in 1994, provide a schedule of all remedies chosen for each of the contaminated site cleanups. The ROD specified eight treatment facilities to be installed and operated. All but one of these treatment facilities have been implemented and are operational. These facilities prevent the migration of groundwater contamination off-site to surrounding areas. The remaining treatment facility has been targeted for construction. Future construction is based on allocated budgets pursuant to federal and state priority concerns.

### *Floodplains*

A 1992 study conducted by DOE and the University of California, found that there are two areas on the LLNL site where there is a 100-year storm potential for flooding: Arroyo Las Positas and Arroyo Seco (US DOE & UC, 1992, p. 4-173). The Flood Insurance Rate Maps produced as a result of this study identified areas within Alameda County/Livermore for the Federal Emergency Management Agency. However, there are no existing on-site structures or roads within the 100-year floodplain at LLNL. Arroyo Seco crosses the LLNL site at the southwestern corner for a distance of about 900 feet. The 1992 FEIS/EIR indicates that the 100-year storm event is contained within the channel and poses no threat to the site.

### *Wetlands*

Wetlands at LLNL are very limited at the LLNL site. They occur along Arroyo Las Positas at the northern perimeter of the site. The wetlands occur in three distinct areas that occupy approximately 0.36 acre and are associated with culverts that channel runoff from the surrounding area into this arroyo. These wetlands are dominated by saltgrass (*Distichlis spicata*). Other species observed during this study included, willow (*salix* sp.), cattail (*typha* sp.), curly dock (*Rumex crispis*), ryegrass (*Elymus* sp.), and Hooker's evening primrose (*Oenothera hookeri*) (US DOE & UC, 1992, p. 4-114). The distance from the wetlands to the DWTF, the nearest hazardous waste storage and treatment area is approximately 250 feet south of the Arroyo Las Positas and is separated by existing roadways.

Analysis of Potential Impacts:

An increase in surface water runoff and a reduction in the amount of recharge to the local ground water aquifer would occur as a result of the increase in impermeable surface under the proposed project. However, this is considered a less than significant impact because the LLNL site soils are highly permeable and an abundant uncovered acreage remains for groundwater recharge.

Construction associated with the project would also occur well outside of the Arroyo Las Positas and Arroyo Seco and would therefore not impact any riparian areas or wetlands. Besides the arroyos, the no other water resource is known to be in the vicinity of the project. Therefore, no adverse changes are expected to any water resources that would result in the loss of diversity among plants and animals residing in that water.

The proposed action would comply with any and all Best Management Practices which are listed in the *Storm Water Pollution Prevention Plan Livermore Site, Lawrence Livermore National Laboratory, Livermore, California, May 1994* and the requirements of Waste Discharge Restrictions 94-131, National Pollutant Discharge Elimination System permit number 0081396. These restrictions, which apply to construction projects, would ensure that the proposed work in the B280 CSU and the DWTF would not violate any storm water or sewer discharge requirements.

A potential impact to the Livermore Water Reclamation Plant (LWRP) is the discharge of wastewater into the sewer system from the treatment of hazardous waste which may contain chemicals and metals that may upset the LWRP. It is for this reason that the LWRP requires permits for wastewater discharges to the city sanitary sewer system. Under the provisions of this permit, LLNL conducts a self-monitoring program at its outfall into the Livermore sewer system (at Building 196). Effluent discharges are sampled continuously, daily, weekly, and monthly and analyzed for metals, radioactivity, toxic chemicals, and water quality parameters to determine compliance with effluent pollutant limitations. Effluent pollutant limitations stipulated in LLNL's wastewater discharge permit are shown in Table 4. Also shown in Table 4 are regulatory limits for radioactivity. The LWRP permit does not set limits for radionuclides directly but defers to the DOE and Nuclear Regulatory Commission (NRC) limits. The monitoring results of the LLNL effluent are reported monthly to the LWRP.

Current administrative and engineering controls that LLNL implements to prevent potentially contaminated wastewater from being discharged directly to the sanitary sewer include:

- C Waste generators receive training on proper waste handling. LLNL personnel review facility procedures and inspect processes for inappropriate discharges.
- C Retention tanks are used to collect wastewater from processes that might release contaminants in quantities sufficient to disrupt operations at the LWRP. For facilities with installed retention tank systems, collected wastewater is discharged to the sanitary sewer only if analytical laboratory results show that the pollutant levels are within

allowable limits. LLNL has developed internal discharge guidelines for specific sources and operations to ensure that sewer effluent for the entire site complies with LLNL's waste discharge permit. If pollutant levels exceed permissible concentrations, the waste water is treated at LLNL Hazardous Waste Management Facility to reduce pollutants to the lowest levels practical and below LLNL guidelines, or it is shipped to an off-site treatment or disposal facility. Liquids containing radioactivity are handled on site and may be treated using processes that reduce the activity to levels well below those required by DOE Order 5400.5.

- C To verify the success of training and control equipment, wastewaters are sampled and analyzed at significant points of generation, as defined by the type and quantity of contaminant generated.
- C As a best management practice, the outflow to the municipal collection system is sampled continuously and analyzed in real time for conditions that might upset the LWRP treatment process or otherwise impact the public welfare. The effluent is continuously monitored for pH, selected metals, and radioactivity. If concentrations above warning levels are detected, an alarm is registered at the LLNL Fire Dispatcher's Station, which is attended 24 hours a day. The monitoring system provides a continuous check on sewage control and, since July 1990, automatically notifies the LWRP in the event that contaminants are detected. Trained staff respond to all alarms to evaluate the cause.
- C A major upgrade to the continuous monitoring system was completed in 1996. Analyzers for continuous monitoring for metals were redesigned to increase the operational safety of the system and to decrease the length of downtime in the continuous monitoring of metals. The redesign included replacement of x-ray tubes and power supplies used in analyzers, reconfiguration of x-ray shielding to accommodate the physical characteristics of the new x-ray tubes, and installation of an enclosure that surpasses safety mandates.
- C The Sewer Diversion Facility automatically activates when the monitoring system sounds an alarm. The diversion system ensures that all but the first few minutes of the affected wastewater flow is retained at LLNL, thereby protecting the LWRP and minimizing any required cleanup. Up to 775,000 L of potentially contaminated sewage can be held pending analysis to determine the appropriate handling method. The diverted effluent may be returned to the sanitary sewer (if the liquid is not hazardous or after the contamination level is adjusted, depending on analytical results), shipped for off-site disposal, or treated at LLNL Hazardous Waste Management Facility. All diverted sewage in 1996 was returned to the sanitary sewer.

C LLNL has 3 satellite monitoring stations (86B, 51A, and 163A) that operate in conjunction with the sewer monitoring system. The satellite monitoring stations are positioned at strategic locations within the main sewer system to help pinpoint the on-site area from which a release might have originated. Each station consists of an automatic sampler that collects samples on a time-proportional basis. If there is a release, these samples are analyzed.

The above controls would also apply to the wastewater discharged from LLNL's hazardous waste management units. Included in the LLNL's Part B application are procedures that require treated wastewaters to be tested for compliance with the wastewater discharge permit limits, prior to discharge to the sewer (Part B, 1996, Vol. 4, p. 60). If necessary, the wastewater is re-treated to meet these limits.

In 1996, LLNL received greater than 99% compliance with LWRP permits covering discharges into the sanitary sewer. Although no NOV's were written in 1996 for the sanitary sewer, two letters of concern were issued concerning pH excursions. On March 31, 1997, LLNL was issued a NOV for a pH exceedance on February 12 for a pH spike below 5, and a silver exceedance on February 5. The silver release occurred which resulted in a daily composite concentration of 0.56 mg/L (The silver violation was likely caused by a photoprocessing operation.) The NOV specifically targeted these two discharges, but treated the pH exceedance as a continuation of the low pH exceedances in 1996. These violations have not been attributed to the treatment of hazardous waste because a review of the treatment logs from the Area 514 Facility from January through August 1997 revealed no pH or silver exceedances. LLNL has already responded to the LWRP's request for a plan to eliminate future exceedances.

As mentioned earlier, although wastewater discharge violations have occurred, none of them can be attributed to hazardous waste treatment processes. The HWFP will, however, require that LLNL comply with local agency permit requirements for the proposed project and will enforce procedures regarding wastewater discharges contained in the Part B application. Since past violations have not been attributed to wastewater discharged from the treatment of hazardous waste and assuming that LLNL complies with the procedures in its Part B and permit, the project is expected to pose less than significant impacts to the LWRP or its discharges to surface water.

Due to compliance with water discharge permits from the LWRP, the treated wastewater generated from the project and discharged to the sanitary sewer is not expected to degrade water quality. Stormwater would also be discharged according to the limits established in LLNL's NPDES permit to ensure that surface or groundwater is not adversely impacted. The project is also not expected to interfere with groundwater recharge because even after the project is built, there will still be abundant uncovered acreage for groundwater recharge. Large amounts of water would not be used because the project will use high pressure washers and recirculate washwater. No substantial flooding is expected since the project is not located within the 100-year floodplain. The project would result in the covering of an area of approximately 240,000 square feet (400 ft by 600 ft) with buildings and pavings. This surface area is relatively small compared to the open space in the vicinity and therefore the disruption and overcovering of soil

would not lead to substantial changes to direction of water movement, changes to absorption, recharge, surface runoff rates, or the existing drainage pattern of any water body.

Based on the above analysis, impacts posed by the project on surface and groundwater is expected to be less than significant and any water quality effects of the project will not result in adverse change to plant or animal habitat.

Findings:

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant</i>	<i>No</i>
9	9	:		9

#### 4. Plant Life

Description of Environmental Setting:

The Livermore site is a developed area that provides only marginal wildlife habitat because of the high degree of human activity and the few areas of undisturbed vegetation. Of the 3.3 km<sup>2</sup> (823 acres) comprising the Livermore site, 2.6 km<sup>2</sup> (640 acres) are covered by roads, parking areas, and buildings. The developed areas at the LLNL Livermore site are planted with ornamental vegetation and lawns. Annual wild oat along with non-grass annuals and perennials now dominate the grassy areas of the site. The common plant species are ripgut brome (*Bromus diandrus*), slender oat (*Avena barbata*), star thistle (*Centaurea solstitialis*), Russian thistle (*Salsola kali*), turkey mullein (*Eremocarpus setigerus*), alfalfa (*Medicago sativa*), sweet fennel (*Foeniculum vulgare*), California sagebrush (*Artemisia California*), and Italian ryegrass (*Lolium multiflorum*). (US DOE, 1996, p. 25)

A relatively undisturbed plant community at the site is a remnant of the native wooded riparian plant community along Arroyo Seco. This arroyo bisects Sandia National Laboratory and traverses the southwest corner of the LLNL Livermore site. At the LLNL site, Arroyo Seco is steep-sided, with the slopes covered with grass species such as slender oat and ripgut brome. Much of the arroyo has native tree species such as red willow and California walnut, and introduced species such as black locust and almond (US DOE & UC, 1992, p. 4-93).

A resource survey conducted at LLNL Livermore in 1986, and a biological assessment conducted in 1991 pursuant to the U.S. Endangered Species Act and the State of California Endangered Species Act addressed the status of threatened, endangered, and other species of concern (referred to as sensitive species) that may occur or are known to occur in the area. Although several listed and proposed endangered and threatened species of plants may occur in the general area of the LLNL Livermore site, the U.S. Fish and Wildlife Service determined that, to the best of its knowledge, these species are not known to occur within the boundaries of the LLNL site. (DTSC, 1996, p. 20)

Analysis of Potential Impacts:

Area 612, Building 280 and the DWTF will be located within the Livermore site which is heavily developed and provides only few areas of undisturbed vegetation. Plant communities at the LLNL site have been highly altered as a result of human activity. The original grasslands and riparian areas were affected by grazing and farming long before LLNL was first constructed.

Because the proposed action would occur within a heavily developed area, it would not have an impact on the relatively undisturbed buffer zones. Construction and operation of the project will occur in areas that have very minimal plant life and contain no threatened and endangered plants.

Except for the few areas of uncovered soil, most of the site is covered by roads, parking areas and buildings and provide minimal habitat for plant life. Therefore, no adverse effects are anticipated to native and non-native plants, to rare and unique plant life and ecological communities dependent on plant life. Since there are no known endangered and threatened species at the site, no adverse effects are expected on such plants or their habitat. Due to the heavily developed area in which the project will be located, no adverse effects on marine and terrestrial plant species and the ecological communities in which they reside are expected. In summary, the project will have no impacts to plant life.

Findings:

	Potentially	Potentially	
Potentially	Significant	Less Than	
Significant	Unless	Significant	No
Impact Mitigated	Impact	Impact	
9	9	9	:

## 5. Animal Life

Description of Environmental Setting:

The LLNL Livermore site hosts numerous birds, reptiles, and amphibians with a minimum of 3 species of amphibians and reptiles, 10 species of mammals, and 31 species of birds. Jackrabbits are the most common wild mammal present. Gophers, snakes, and field mice can also be found in the undeveloped areas of the Livermore site. (US DOE, 1996, p. 25)

A resource survey conducted at LLNL Livermore in 1986, and a biological assessment conducted in 1991 pursuant to the U.S. Endangered Species Act and the State of California Endangered Species Act addressed the status of threatened, endangered, and other species of concern (referred to as sensitive species) that may occur or are known to occur in the area. Although several listed and proposed endangered and threatened species of animals may occur in the general area of the LLNL Livermore site, the U.S. Fish and Wildlife Service determined that, to the best of its knowledge, these species are not known to occur within the boundaries of the LLNL site.

Since that time, one State-protected bird species, a nesting pair of White-tailed Kite (*Elanus leucurus*), has been found near the East Gate less than 0.5 mile from Area 612 and Building 695 and have successfully fledged young in 1994 and 1995 in spite of normal daily traffic and routine maintenance activities. Also, one State species of special concern, the Burrowing Owl (*Athene cunicularia*), has been observed in the north buffer zone of the site approximately 0.8 mile northwest of Building 695. (LLNL, HRA, 1997, p. A-10). On July 19, 1997, a special status species survey was conducted in the Arroyo Las Positas to determine the presence of the California Red-legged Frog which recently had its status elevated to "Threatened" under the Endangered Species Act. Individual frogs were identified in several areas of the arroyo at the LLNL mainsite. The channel making up the Arroyo Las Positas enters the LLNL Livermore site from the east, is diverted along a storm ditch around the northern edge of the site, and exits the site at the northwest corner. The entire arroyo, as well as a narrow strip of adjacent uplands, is considered potential habitat for this species. The arroyo passes within 300 ft of Building 695.

*Analysis of Potential Impacts:*

The locations of Building 280, Area 612, and the proposed location of the DWTF are all within developed areas of the site. None the construction activities will occur in the locations where the Burrowing Owl, White-tailed Kite and the California Red-legged Frog have been observed. As a precaution, however, the HWFP will require that, prior to construction-related activities, a survey be conducted to determine the presence or absence of the White-tailed Kite near the LLNL site east gate. If the species is present, incremental, construction-related traffic activity at the east gate would be minimized during its mating, nesting, and rearing seasons.

In addition, LLNL is aware that the Arroyo Las Positas, which is a habitat for the California Red-legged Frogs, is located approximately 300 ft from the DWTF. The Arroyo Las Positas and up to approximately 50 feet on either side of the channel contain the aquatic and upland/riparian habitat for red-legged frogs. Since the DWTF contains no aquatic habitat features, generally lacks vegetative cover, and is a relatively disturbed site with a dirt or gravel surface, it is not expected that red-legged frogs would utilize the DWTF area for aestivation or dispersal. However, due to the proximity of the Arroyo Las Positas, loss of the species may occur from the low potential of frogs straying into the DWTF construction area. To mitigate this impact to a less than significant level, LLNL is required to conduct an awareness program which would involve informing construction and operations personnel of the red-legged frog and its habitat and instructing them to avoid these areas. Workers would also be instructed to immediately contact the LLNL wildlife biologist of any frog species observed in the project area.

Therefore, although the construction of the DWTF would involve the paving of approximately 240,000 square feet (5.5 acres), impacts to wildlife are expected to be less than significant since development will occur within the boundaries and proposed growth areas of the site and are considered sufficiently distant from sightings of the White-tailed Kite, Burrowing Owl, and the California Red-legged Frogs. Finally, since modifications to Building 280 and Area 612 would involve only minor disturbances of existing structures, no disruption of any new areas that may potentially host wildlife would occur. No adverse effects to threatened and endangered animals such as the White-tailed Kite and the California Red-legged frog when considering that surveys

of the construction are will be conducted prior to any construction activities. Since construction will occur well outside the buffer zone, the habitat for the Burrowing Owl and the Arroyo Las Positas, the habitat for the California Red-legged frog, no adverse effects are expected on the habitats of such species.

No adverse effects are expected on marine and terrestrial animals species and their habitats as the project will not disturb any water resources and will only disturb soil in areas that do not support wildlife, in areas that support wildlife typical of build-up areas, or in areas the support species typical of early successional habitats.

Findings:

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Less Than Significant Impact</i>	<i>No Impact</i>
9	9	:	9

## 6. Land Use

Description of Environmental Setting:

Land uses near the LLNL site vary from densely populated residential to heavy industrial and manufacturing areas. Other land uses include commercial, institutional, light industrial and manufacturing, agricultural, and sparsely populated and rural residential areas. On-site land uses include offices, labs, support facilities, roadways, parking areas, and landscaping.

LLNL's perimeters consist of rural areas dominated by agricultural use and open space. Property to the south includes agricultural areas, low-density residential areas, and Sandia National Laboratory which is also surrounded by DOE-owned land. To the west, a mixed density, single-family residential subdivision begins and extends south and west. Property to the east is agricultural land and low-density residential development. A parcel of open space and agricultural land (287 acres) has recently been rezoned to allow development of a center for heavy industry. To the north is a light-industrial park. DOE has acquired additional land along the western and northern boundaries of the Livermore site to serve as a buffer zone.

Most of the LLNL site is designated "industrial" and the perimeter areas on the western and northern portions of the site are designated "industrial or agricultural." Areas north and west of the site are also designated for "industrial" and "low to low-medium density" residential uses, respectively. The exception is a parcel located to the northwest, where there is a multiple unit apartment complex. Areas south and east of the site are designated "agricultural."

Analysis of Potential Impacts:

The LLNL Livermore site is exempt from local plans, policies, and zoning regulations. However, it is DOE and UC policy to cooperate with local governmental planning agencies, in this case the City of Livermore and County of Alameda, whenever possible (US DOE & UC, 1992, p. 5-6). The proposed project is compatible with existing and approved future land uses surrounding the site. Even with the construction of the new buildings associated with the DWTF, the project would not represent any changes to land uses, nor lead to a conflict with existing and approved future land uses adjacent to the site and therefore would pose no impacts.

Findings:

	Potentially Significant Unless Impact Mitigated	Potentially Significant Unless Impact Mitigated	Less Than Significant Impact	No
	9	9	9	:

## 7. Natural Resources

Description of Environmental Setting:

The present and potential stone and aggregate resources of the eastern Livermore Valley and western San Joaquin County were assessed in 1987 and 1988 (California Division of Mines and Geology, 1987, 1988). Mineral Resource Zones have been established that identify sand, gravel, and stone source areas. Within the eastern Livermore Valley several deposits have been identified as recoverable and marketable resources. Land that is currently developed for urban areas, industry, or research, including the LLNL main site, was not included in these inventories (US DOE & UC, 1992, p. 4-80).

Three types of mineral resources, clay, coal, and silica (California Division of Mine, 1950), have been mined or have the potential to be mined in the vicinity of the LLNL main site. Several occurrences of other potentially economically valuable mineral deposits are within a 10-mile radius of the main site. These include deposits of manganese, chromium, clay, gemstones, pyrite, dimension stone, sand and gravel, and natural gas. No commercially exploitable mineral deposits are known to exist within the boundaries of the main site.

The Livermore oil field just east of the main site was discovered in 1967 and to date is the only oil field in the Livermore-San Ramon Valley area (California Division of Oil and Gas, 1982). The Livermore oil field is now operated by the American Exploration Corporation. Of the original 10 wells, 5 are still producing an average of seven barrels of oil per day. Reserves are thought to be only 132,000 barrels and production is declining (California Division of Oil and Gas, 1986). (US DOE & UC, 1992, p. 4-82)

The primary source of domestic water for the main site is the City of San Francisco's Hetch Hetchy water system. An alternate backup source is Zone 7 of the Alameda County Flood Control and Water Conservation District (US DOE & UC, 1992, p. 4-207). The main site consumed an average of 261.8 million gallons per year from 1986 through 1990. The water consumption rates, however, have declined steadily since 1986, down to 223 million gallons in 1990. (US DOE & UC, 1992, p. 4-207)

Electrical power is supplied to the main site by Pacific Gas and Electric Company (PG&E) and the Western Area Power Administration (US DOE & UC, 1992, p. 4-209). The Livermore site's current electrical consumption is approximately 328 million kilowatt-hours per year. This represents an estimated 3 percent of the total annual demand for residential, commercial, industrial and other consumers in Alameda County.

Natural gas is supplied to the Livermore site by PG&E. Natural gas consumption is approximately 14,160,000 cubic meters per year and is used mostly for comfort heating in buildings and programmatic experimental use.

Analysis of Potential Impacts:

Since there are no commercially exploitable mineral deposits known to exist within the boundaries of the main site, the project would not affect the extractability of such natural resources. In addition, the proposed project is not expected to significantly increase the consumption of water, electricity, gasoline or natural gas at the main site because:

- there is basically no change in operations in Area 612 ,
- the units being installed in Building 695 for the most part replace existing units found in the Area 514 Facility, and
- Building 280 is a replacement of Building 233.

Therefore, since there are no new operations that will significantly increase amounts of natural resources currently being consumed, no impacts to natural resources are expected.

Findings:

	Potentially	Potentially	
Potentially	Significant	Less Than	
Significant	Unless	Significant	No
Impact Mitigated	Impact	Impact	
9	9	9	:

## **8. Risk of Upset**

### ***Description of Environmental Setting:***

LLNL generates a wide variety of hazardous and mixed wastes through laboratory and research activities and maintenance activities. Generators accumulate their wastes at satellite accumulation areas where they are logged into the hazardous waste management system. From there, they are either shipped directly to off-site recyclers or to treatment, storage and/or disposal facilities (TSDs) or taken to one of the LLNL's hazardous waste receiving areas. Solids will be taken directly to receiving Area 612-4. Liquid wastes in portable tanks and containers could be taken to either Area 612-4 or directly to the DWTF. They will be logged in and routed either to a storage unit or to the appropriate treatment unit. Normal operations involved with the project are described below:

### ***Building 280 Container Storage Unit (B280 CSU)***

Building 280 will be used to store only solid hazardous and mixed waste in containers that are up to 250 ft<sup>3</sup> in volume. Handling operations conducted in this building include container storage and sampling. Forklifts will be used for the loading and unloading of pallets of containers. LLNL will be allowed to stack containers no more than seven (7) feet high except for storage boxes that are 4' x 4' x 7' in size. These may be stacked three-high provided that LLNL uses steel straps and threaded rods, washers and nuts to stabilize each triple stack. The B280 CSU is not located in a flood zone. Run-on is prevented by the structure itself, an exterior grade that slopes away from the facility and gutters and downspouts that direct rainwater to nearby storm drains. Run-off controls include a reinforced concrete floor with below-grade sumps built into the floor. Containers are elevated on pallets or skids to provide additional protection against potential spills. The secondary containment system consists of a cement floor with a shallow swale leading to a single blind sump, an access ramp at the exterior door opening, and perimeter curbing except at the ramp structure. The floors and sumps are coated with an epoxy sealant. Since only solids are stored, secondary containment capacity is provided mainly for the volume of fire protection water that may be released in the event that the automatic fire distinguishing system is triggered.

The B280 CSU is equipped with a fire detection and alarm system that will detect the presence of heat or smoke and alert the LLNL Fire Department. The unit is also equipped with an automatic wet-pipe extinguishing system that will activate in the event of a fire. The sprinkler system is in compliance with the National Fire Protection Association (NFPA) Standard 13, the standard for the installation of sprinkler systems.

### ***Area 612 Container Storage/Treatment Unit Group (A612 CSTUG)***

The Area 612 CSTUG is designed to manage hazardous, radioactive, and mixed waste streams generated by LLNL's research and support organizations. Waste streams include, but are not limited to: spent plating solutions, rinse waters, machine shop wastes, acids, caustics, photographic chemicals, solvents, oils, medical wastes, and miscellaneous laboratory solutions

and chemicals. Specifically designated units in the A612 CSTUG are also designed to manage PCBs and PCB contaminated materials, asbestos debris, mixed waste, low-level radioactive wastes, and transuranic wastes in addition to the above-mentioned waste streams.

Specific activities conducted in the A612 CSTUG involve lab packing, waste packaging, container storage, size reduction, drum crushing, and preparation of hazardous and radioactive waste for shipment to off-site treatment and/or disposal facilities. These activities are conducted in the two treatment units and 11 storage units located in A612 CSTUG (see Project Description located under Section I of this Initial Study for a description of the units).

Although LLNL is not located in a flood zone, A612 CSTUG contains run-on control structures such as berms, grades that slope away from the units; roofs, tents, or structures over units; and storm drains. Berms are engineered structures that may be curbing, foundations, and ramp systems. Run-off control structures, such as berms, are located at the A612 CSTUG to control releases and collect rain water that may be contaminated with hazardous residues. Each liquid container storage unit is equipped with secondary containment that is impervious to the wastes stored and is sloped so that any surface run-off or releases will accumulate in a given area to facilitate liquid removal operations.

Building 612 Lab Packing/Packaging Container Storage Unit, Building 612 Drum Crusher, and the Building 612 SRU each have high efficiency particulate air filtration systems installed in their ventilation systems to capture particulate emissions.

The following areas have an automatic wet-type extinguishing system that will activate in the event of a fire: Building 612 Lab Packing/Packaging Container Storage Unit, Room 100 in Building 612 (containing the SRU and Drum Crusher), and Building 625 CSU. The Area 612-4 Receiving, Segregation, and Container Storage Unit is equipped with an automatic dry-pipe fire extinguishing system.

### ***Building 693 Container Storage Unit Group (B693 CSUG)***

Building 693 CSUG is comprised of four sub-units: (1) Building 693 Container Storage Unit; (2) Building 693 Annex; (3) Building 693 Yard Roll-off Bin Storage; and (4) Building 693 Yard Freezer Storage.

The B693 Container Storage Unit is used for temporarily storing containers of solid, liquid, or gaseous hazardous and mixed waste, pending treatment at the B695 STUG or shipment to an off-site treatment and/or disposal facility. The B693 Annex is used to store solids such as contaminated soils, scrap metal and empty drums in 55- and 30-gallon containers, metal doors, fiber boxes, plastic and glass containers, and other approved containers. Some types of waste such as acidic aqueous waste, are required to be stored at lower than ambient temperatures, so the B693 Yard-Freezer Storage is used for this purpose. The B693 Yard Roll-Off Bin Storage is used for storing solid hazardous and mixed waste on a temporary basis. These wastes consist of unconsolidated loose solid waste, which may be composed of yard trash, construction debris,

asbestos, and other materials composed of hazardous and mixed constituents. Separate bins will be used for the storage of mixed wastes and hazardous waste.

The four sub-units or cells that make up the Building 693 CSUG each have their own containment zone. The existing B693 Container Storage Cells has separate secondary containment systems consisting of a continuously poured concrete floor, a sump, and 6-inch curbing. For the B693 Annex, secondary containment is provided for fire sprinkler water only since only solid waste will be stored in the unit. The B693 Yard Freezer Storage will be secured to a reinforced concrete pad under a shed roof cover. Containers placed in the freezer will be on fabricated metal pans secured to the freezer walls. A secondary containment system is not provided for the B693 Yard Roll-off Bin Storage since it will store solid waste only but the bins will be lined with plastic and equipped with lids that can be secured.

Building 693 and the Annex are equipped with fire detection and alarm systems that will detect the presence of heat or smoke and alert the LLNL Fire Department. Cells 1004, 1008, and 1012 are also equipped with an ordinary wet-type automatic extinguishing system, which will be activated in the event of a fire. The sprinkler system is in compliance with the NFPA Standard 13. Water-reactive waste stored in these cells will be in watertight containers. Cell 1000 is equipped with two automatic extinguishing systems: a high-expansion foam system and an automatic, wet-pipe fire sprinkler system.

### ***Building 695 Storage/Treatment Unit Group (B695 STUG)***

The B695 STUG, consisting of the Liquid Waste Processing (LWP) Area, Building 695 Airlock, the Reactive Waste Processing Area, the Small Scale Treatment Laboratory and the DWTF Portable Tank Storage Pad will be used to store and/or treat liquid and reactive hazardous waste and will also contain equipment to treat various solid waste (e.g., debris).

The Tank Farm located within the LWP Area will be used for the storage and treatment of various hazardous waste including acidic and caustic solutions, wastewaters with dissolved and/or suspended solids, and other liquid wastes, sludges, and slurries that contain hazardous waste. The waste will be transported to the DWTF in waste containers ranging from small jugs to portable tanks. In addition, 5,000-gallon tank trailers are typically used to transport rainwater from secondary containment areas. The liquid waste from these transport containers may be unloaded into a receiving tank via the building waste transfer system. This system consists of two transfer lines with disconnect stations that will run in parallel along the western wall of Building 695 between the tank farm and the airlock. The transfer lines will be used to transfer untreated waste and treated effluent between waste containers, treatment systems, and the tank farm. Four quick-disconnect stations will be strategically located along these transfer lines to facilitate the transfer operations. All quick-disconnect stations will be located within a secondary containment zone to contain any leakage and spillage. Each tank has instruments to measure liquid level, temperature, pH, conductivity, density, and oxidation-reduction potential of the waste. Flexible hose and portable pumps will be used to make the final connection between the quick-disconnect stations, waste containers, portable tanks, or treatment equipment. Small containers can also be hand-poured into a tank or treatment vessel. After the transfer has been

completed, the waste containers, portable tanks, treatment equipment, and ancillary equipment will be rinsed.

Treatment methods to be performed in the Tank Farm include neutralization, precipitation, adsorption, and other common wastewater treatment technologies. The Tank Farm will be used in conjunction with other treatment equipment such as the Cold Vapor Evaporator, the Centrifuge, the Filtration Module and the Carbon Adsorption System.

Other treatment equipment located within the LWP Area include a Shredder and Chopper, a Debris Washer, a Solidification System, and a Drum Rinsing Station. The Solidification System will be used to mix solidification agent with hazardous waste in 55-gallon drums which are then sealed, allowed to cure, and shipped off-site for disposal. The Shredder and Chopper will be used to shred/chop debris such as cloth, paper, cardboard, metal, wood, glass, and rubber prior to disposal. The purpose of the Debris Washer will be to remove hazardous and/or radioactive contaminants from debris by spraying and agitating with hot water, detergent, mild acid, mild base or other cleaning agent. The Drum Rinsing Station will be used to rinse empty containers.

LLNL generates a wide variety of waste in small quantities and on a non-routine basis. The Small Scale Treatment Laboratory (SSTL) and the Reactive Waste Processing (RWP) Area will be used to treat these small quantities of waste. The SSTL will be used to conduct small-scale or "benchtop" treatment activities including mercury amalgamation, neutralization, precipitation, reduction, chlorination, cyanide destruction, ion exchange, centrifugation, clarification, coagulation, decanting, encapsulation, filtration, flocculation, sedimentation, thickening, ultrafiltration, evaporation, leaching, blending/bulking, reverse osmosis, and air stripping. The RWP Area will be used to treat small amounts of reactive waste. Two reactors, both 1 liter in size will be used to treat either water-reactive waste such as metal hydrides, earth alkali metal hydrides, and carbides, or waste that requires precise temperature and pressure control as a result of an endothermic, exothermic, or explosive reaction. A Reactive Material Cell will be used for the uranium bleaching process which involves oxidizing uranium mill turnings to eliminate its pyrophoric properties. A Reactive Waste Storage Room will also be constructed for the storage of reactive waste.

Building 695 Airlock will be used for the storage of portable tanks and containers with sizes ranging from 330 to 1,150 gallons. The DWTF Portable Tank Storage Pad will be an outdoor concrete containment area that will be used to store liquid waste in portable tanks and 5,000 gallon tanker trailers. Loading and unloading of waste from the portable tank and tank trucks will not occur within this storage area since the pad will accommodate full portable tanks and the entire loaded tanker trailer.

The Building 695 STUG is designed to provide secondary containment for the following areas: the LWP Area, Building 695 Airlock, Reactive Materials Cell, the RWP Area, the Reactive Waste Storage Room, and the Small Scale Treatment Laboratory, and the Portable Tank Storage Pad. In general, secondary containment for the various Building 695 zones will be provided by sloping the concrete floor to a low point, sump, or trench. Concrete curbs will be constructed at the low ends to provide the required containment. The maximum curb height to be used for

Building 695 will be 4 inches. The concrete floor will be constructed of reinforced concrete that is a minimum of 8 inches thick. For each containment zone, the floor will be installed in a continuous pour. As such, the floor will be free of cracks and gaps. The floor and retaining curbs will be painted with an epoxy coating to prevent the migration of contaminants into the porous concrete surfaces.

The LWP Area will be protected by a wet pipe sprinkler system designed and installed in compliance with NFPA Section 13. The RWP Area will be protected by a dry chemical system conforming to NFPA Section 17. The system will be activated by thermal detectors. Each reactive waste storage room will have its own mist deluge system for fire protection. Separate water supply tanks, each with a capacity of at least 300 gallons will be provided for each deluge system. The fire protection system in the Small Scale Treatment Laboratory will be a wet pipe sprinkler system similar to the system to be installed in the LWP Area.

### *Contingency Plan*

LLNL maintains a contingency plan specific to Building 280, Area 612 and the DWTF. Contingency plans from each of the Hazardous Waste Management Facilities are sent to LLNL's Fire Department, Health Services Department, and Safeguards and Security Department. These departments coordinate all emergency response activities with off-site emergency responders and, therefore, transmit all pertinent information to affiliated off-site agencies, as warranted by the emergency situation.

Pertinent off-site agencies are sent copies of Hazardous Waste Management Facility Contingency Plans. These agencies include all participants in the Twin Valley Mutual Aid Agreement, the Alameda County EMS District Office, Valley Care Medical Center, the Alameda County Sheriff's Office, and the City of Livermore Police Department.

The LLNL Fire Department is familiar with the layout of all Hazardous Waste Management Facilities and, therefore, with the locations where HWM Division operational personnel will be working. Both the LLNL Fire Department and the LLNL Health Services Department are familiar with the types of injuries or illnesses that could result from fires, explosions, or releases from the Hazardous Waste Management Facilities.

The LLNL Fire Department and the Safeguards and Security Department are familiar with all entrances to the Hazardous Waste Management Facilities and the LLNL site, and with all possible evacuation routes.

### *Analysis of Potential Impacts:*

The potential for an emergency at the proposed facility exists due to the activities and the types of material (i.e. toxic, reactive, ignitable, corrosive, and radioactive) it handles. Potential emergencies and impacts that could trigger implementation of the Contingency Plan include:

! Fire

- could cause hazards from thermal effects
- could cause the release of toxic fumes and/or radioactive particles
- could spread and possibly ignite materials at other on-site locations, or cause heat-induced explosions
- could trigger off-site fires
- could produce contaminated run-off from fighting fire with water or chemical fire suppressant.

! Explosion

- could present hazard from flying fragments or shockwaves
- could ignite other hazardous waste at the facility
- could result in release of toxic and/or radioactive substances
- could trigger off-site fires

! Spill or Material Release

- could result in release of flammable liquids or vapor capable of causing a fire or gas explosion hazard
- could cause the release of toxic liquids or fumes and/or radioactive particles

! Operator error or Equipment Failure

- could cause fire, explosion, or spill as described above
- could result in mixing of incompatible substances
- could cause release of toxic and/or radioactive materials to surface or air

Both engineering and administrative controls have been incorporated into the project that would reduce the possibility or the severity of the accidents mentioned above (also see item #14 Public Health and Safety of this Initial Study). A description of these controls can be found in LLNL's Part B application and, if approved, are enforced through permit conditions.

In the event of an emergency, LLNL would implement its Contingency Plan which is designed to mitigate the risks of upset. LLNL maintains a Contingency Plan specific to Building 280, Area 612 and the DWTF. The Contingency Plans establish individual responsibilities during emergencies and provide procedures for responding to fires, spills, earthquakes, and equipment failure. Emergency procedures within the Contingency Plan are specifically discussed in Volume 6 of the 1996 Part B application and are summarized below.

### *Emergency Response*

In the event of a fire, a release of unidentified materials, a release that cannot be cleaned up by two individuals in one hour, releases of hazardous, radioactive or mixed waste outside LLNL boundaries, an incident resulting in injuries requiring medical treatment, or an incident requiring evacuation, the following events would take place:

- 1) The Operations Technician or Technologist first on the scene would

- contact the LLNL's on-site Fire Department by dialing 911,
  - notify the Operations Supervisor or alternate (in case of extremely hazardous, life threatening situation, immediately notify facility personnel on the paging system or activate the incident alarm),
  - if safe, shut-off source of a release, eliminate ignition sources, cordon off the area, or use a fire extinguisher to try to control a fire while waiting for the Fire Department to arrive.
- 3) The LLNL Fire Department will, on the average, respond to a call in 3.5 minutes. One vehicle and three personnel will initially respond to a call-on-site. Additional equipment and personnel will respond as needed.
- 2) Either the Operations Supervisor or the first fire officer to arrive at the scene assumes the Incident Commander role until relieved by a Chief Officer. The Incident Commander is responsible for conducting the following:
- Evaluates the immediate scope of the incident.
  - Activates the LLNL emergency paging system to notify personnel in selected areas, or the entire LLNL site, if necessary, and initiates evacuation of personnel, if appropriate.
  - Notifies the Environmental Operations Group Environmental Analyst and the Health and Safety Technician.
  - Notifies appropriate state or local agencies of their designated response roles if their help is needed (enlists support from agencies that participated in the Mutual Aid Agreement. If necessary, ensures that the State Office of Emergency Services has been notified).
  - Prevents the occurrence, recurrence, and spread of fire, explosion, and waste release by stopping all waste handling processes and operations in the area.
  - Directs the collection and containment of released waste and the removal or isolation of incompatible waste containers.
  - Directs monitoring activities for leaks, pressure build-ups, gas generation, or ruptures in valves, pipes, or other equipment, whenever appropriate.
  - Ensures that all recovered wastes or material, contaminated soil, or surface water is treated, stored, or disposed of in accordance with all applicable regulations.

- Ensures that personnel are properly decontaminated before being released from an incident.
  - Ensures that all emergency equipment used to mitigate the incident is cleaned and fit for its intended use before operations are resumed.
  - Ensures that all required notifications to outside agencies take place.
- 3) On-site support organizations consisting of the Hazards Control Department, Environmental Protection Department, Credibility Assessment Team, Health Services Department, Plant Engineering Department, Safeguards and Security Department, and the Public Information Office are coordinated to accomplish the Incident Commander's responsibilities. During the emergency, specific responsibilities of each support organization are as follows:

The **Hazards Control Department** is responsible for providing personnel and equipment from the Fire Safety Division. Run Cards (information cards) are maintained by the Fire Safety Division to advise fire officers regarding hazard information and special actions required for each facility. This department can also provide, from its Safety Services Division, radiation measurements, radioactive sample analysis and radiation survey instruments to support personnel in the field in addition to analysis of toxic materials, industrial hygiene instruments, and personal protective equipment. Technical support on high-pressure systems, electrical hazards, explosives, impacts from exposure to ionizing radiation and radioactive contamination can also be obtained. Also under this department is the Atmospheric Release Advisory Capability (ARAC) group which can provide real-time assessments of the consequences of an atmospheric release of radioactive material and advisory services through analysis of hypothetical scenarios, routine assessments, and evaluations involving atmospheric release of toxic materials.

The **Environmental Protection Department** is responsible for assessing the incident for the purpose of coordinating necessary clean-up and corrective measures, supplying equipment and personnel to contain and clean up spills and maintaining a supply of emergency response equipment. The Environmental Monitoring Group under this department is responsible for determining if air releases have been detected by samplers used in the routine air-monitoring program and by portable air samplers, performs air dispersion modeling to show potential air contaminant migration; responds to incidents involving the detection of contaminants in the sanitary sewer system, and samples water, soil, vegetation, and any other environmental media. This group has the primary responsibility for operating the sanitary sewer monitoring station and activating the diversion system, if the system detects contaminants above acceptable levels.

The **Credibility Assessment Team** is used as a resource for obtaining information on the design and fabrication of improvised nuclear and non-nuclear explosive devices, on psycholinguistic or psychologic threat message analysis, and on adversarial behavioral analysis.

The **Health Services Department** is responsible for providing medical care during emergencies using both LLNL and off-site non-Laboratory capabilities. Both ground and air transportation are available to local hospital emergency facilities. Air transport of patients is provided by Alameda County. Both the Valley Memorial Hospital in the City of Livermore and Eden Hospital in Castro Valley are equipped to treat radiologically contaminated personnel while the Tracy Community Hospital will be used for treatment of patients who are not radiologically contaminated. This department is also responsible for maintaining a mobile disaster supply trailer containing blankets, cots, medical and orthopedic supplies, bandages, respiratory equipment, radios, and documentation supplies.

The **Plant Engineering Department** have personnel on duty 24 hours a day that can be called upon to correct malfunctions.

The **Safeguards and Security Department** is responsible for controlling personnel access, including site evacuation, during an emergency; executing security measures and mutual-aid agreements; being a liaison with outside law enforcement; and assessing tactical situations.

The **Public Information Office** functions as the point of contact for the release of emergency-related information from LLNL.

- 4) In the event that the emergency cannot be handled by LLNL's internal emergency response organizations, mutual aid agreements that cover fire, medical, rescue and radiation emergencies are in place between LLNL and the following agencies: Alameda County (Medical Response), Alameda County (Fire Service Operational Plan), Valley Memorial Hospital (Radiation Emergency), State of California Office of Emergency Services, UC Davis (Applied Science Department-LLNL Building 661), City of Livermore (Automatic Aid Agreement), City of Tracy, UC and State of California (Master Mutual Aid Agreement), and Twin Valley Mutual Aid.

#### *Transportation Release*

LLNL has an emergency response plan and procedures for on-site transportation-related incidents involving hazardous and radioactive materials and wastes. Supplements to LLNL's Health and Safety Manual also address specific transportation concerns such as shipping of explosives and radioactive substances.

These procedures detail specific activities for first response and evaluation of a hazardous spill, actual clean-up, records keeping, and subsequent follow-up to eliminate, if possible repeat incidents. They also identify administrative roles and responsibilities, lines of authority for coordinating emergency response, and requirements for clean up after a transportation related accident.

Compliance with U.S. Department of Transportation (DOT) and/or DOE requirements for packaging hazardous and radioactive materials reduces, if not eliminates, the impacts of any release of any hazardous or radioactive materials resulting from an accident. Packaging requirements for hazardous and radioactive shipments are detailed in DOT (49 CFR 109-199) and Nuclear Regulatory Commission (10 CFR 71) regulations. These requirements apply to shipments of hazardous and radioactive materials and wastes from LLNL.

In addition, hazardous and radioactive material packages are labeled and the transport vehicle is placarded. Shipping papers and documentation requirements also provide necessary information for emergency response. These requirements are specifically identified in DOT regulations (49 CFR 172.600).

### *Emergency Equipment*

LLNL maintains emergency equipment throughout its facilities consisting of the following:

**Internal Communication System** - Telephones are located in all hazardous waste management areas that can access the LLNL Emergency Dispatcher and other key personnel. A paging system is also available to alert personnel within an area. Several mobile telephones are available to HWM personnel as well as hand-held portable communication radios. In addition, all HWM Division Operations personnel wear radio pagers. Fire and incident alarm pull stations are also available at several locations.

**External Communication System** - The LLNL Fire Department is notified of an incident in one of several ways: through the Emergency Dispatcher, who is summoned by dialing ext 911 on any telephone; by the automatic sprinkler fire suppression systems, which include alarms that are activated at the Emergency Dispatch Center whenever water flows through the sprinkler lines, and by any of the fire or incident alarms, that (when pulled) activate an alarm at the Emergency Dispatch Center. In addition, the Dispatcher may warn personnel over the sitewide public address system.

**Fire Suppression System** - Automatic sprinkler, wet pipe fire suppressions systems are installed in various areas and building as described in the Environmental Setting above. The action of the water flowing through the sprinkler line activates an alarm at the Emergency Dispatch Center who then notifies the LLNL Fire Department. Fire extinguishers are also located in areas of specific fire hazards. All HWM Division personnel actively engaged in operations involving hazardous waste are trained in the use of fire extinguishers. Several fire hydrants within the vicinity of all buildings are also available for emergency response.

**Response Equipment** - Emergency spill kits are provided in key locations of the hazardous waste management units. HWM Division also maintains a release-response trailer containing bulk quantities of release-response equipment that are used to support the Fire Department when mitigating releases. The LLNL Fire Station consists of four large capacity pumpers including one ladder truck and one 4-wheel drive, one smaller capacity 4-wheel drive pumper, a special services unit with hazardous material containment equipment, two ambulances, and three command vehicles. A variety of heavy equipment is available from Plant Engineering and includes, but is not limited to, compressors, cranes, cutting torches, forklifts, generators, pumps, scrapers, and bulldozers.

**Personal Protective Equipment** - Eyewash stations and showers are available in storage and treatment areas. Protective clothing for normal operations and emergency situations consist of assorted gloves, booties, coveralls, ear plugs, goggles, face shields, lab aprons, and self-contained breathing apparatus.

**Decontamination Equipment** - The HWM Division maintains equipment that is available to decontaminate areas that were in contact with the released hazardous, radioactive, or mixed materials or wastes. This includes containment booms, mops, brooms, shovels, a steam cleaner, pressure washer, electric floor scrubber, and a mercury vacuum cleaner. The Size Reduction Unit in Area 612 can be used to perform decontamination, rinsing, vacuuming, cutting, and waste verification operations.

### *Conclusion*

Emergency preparedness at LLNL relies upon the capabilities and resources of on-site organizations, the accessibility of emergency response equipment in multiple locations, and a communication system with multiple redundancy. Additionally, off-site support is available through mutual aid agreements with the local community. LLNL's Hazardous Waste Management (HWM) Division employees are trained in proper response actions and in the use of emergency equipment commensurate with their jobs. Based on LLNL's emergency response plan, in conjunction with their engineering and administrative controls designed to prevent accidents and hazardous and/mixed waste releases to the environment, the potential risk to the public and surrounding environment from an emergency at LLNL is considered less than significant.

### *Findings:*

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact Mitigated</i>	<i>Potentially Significant Unless Impact Mitigated</i>	<i>Less Than Significant</i>	<i>No</i>
9	9	:		9

## **9. Transportation/Circulation**

### *Description of Environmental Setting:*

Access to the Livermore site is from two arteries which connect the site to Highway 580. These arteries are Vasco Road and Greenville Road. Access to the Livermore site from the City of Livermore is achieved primarily by East Avenue. Existing peak hour traffic counts show that LLNL contributes a high proportion of the local daily traffic in the a.m. peak hour. The existing trip distribution patterns show the Vasco Road corridor to be the most utilized. The distribution of the a.m. peak-hour traffic from the site is as follows: 38 percent on Vasco Road, 28 percent on Greenville Road towards the I-580 freeway, 30 percent on East Avenue, 2 percent on Patterson Pass Road, and 2 percent on Greenville Road. (US DOE & UC, 1992, p. 4-195)

The Livermore site has a well developed network of roads within its 1.3 square miles of property. All traffic regulations inside LLNL conform to those of the state of California. The maximum speed limit posted on-site is 25 mph; an exception is a speed limit of 35 mph in portions of the North Outer Loop Road. The speed limit within parking lots and Hazardous Waste Management Facilities is 15 mph. Average daily traffic (total number of cars passing over a segment of roadway in both directions) for the LLNL Livermore site is estimated to be approximately 23,960 vehicle trips. The estimated distribution of trips are as follows: 32 percent at Westgate Drive, 23 percent at Southgate Drive, 8 percent at West Perimeter Drive, 14 percent at Mesquite Way, 20 percent at East Gate Drive, and 3 percent at the truck entrance on East Avenue. (US DOE & UC, 1992, p. 4-195)

### *Analysis of Potential Impacts:*

#### *Circulation*

Transportation involved with the project will consist of vehicles used for construction, shipments of waste into the Hazardous Waste Management Facilities (HWMF), and shipments of waste to off-site treatment and disposal facilities.

Building construction at the DWTF area may result in short-term circulation impacts if vehicles are rerouted through the site to avoid construction areas. However, it is anticipated that adequate detour routes and signage would be provided and that the impacts would be brief in nature and are therefore considered less than significant.

Waste received into the HWMF come only from on-site generators and from Site 300. The estimated volume of vehicles entering the Area 612 Facility is two vehicles per hour. Traffic to the DWTF and Building 280 is not expected to exceed two vehicles per hour (Part B, 1997, Vol. 1, Part II, p. 6). Shipments from LLNL to off-site treatment and disposal facilities is expected to average 20 per month. On the average, each shipment usually consists of only one vehicle ranging from small trucks to semi-trailers.

When considered in conjunction with the 21,000 vehicles per day that come in and out of the site, the amount of traffic associated with the project is considered small and no significant impacts are expected on exhaust emissions, parking facilities, and major transportation routes as a result of the project. The change in movement of hazardous materials to the DWTF instead of the Area 514 Facility is considered minor since it will only affect the traffic pattern on-site.

Vehicles associated with the project is not expected to increase traffic hazards to other vehicles, bicyclists or pedestrians on-site since the amount of these vehicles are very small compared to the average daily flow of 21,000 vehicles into and out of the site. In addition, all hazardous waste is transported by registered haulers who must comply with transportation requirements and regulations for specific types of hazardous materials and wastes that they transport.

The 1992 EIS/EIR described the level of service for the East Avenue/South Vasco Road intersection (which is the major intersection serving the Livermore Main Site) as level of service (LOS) B. LOS is defined as a percentage of volume over capacity of a given roadway. This relative value for this intersection indicates that the volume of traffic was approximately 60 percent of the rated capacity. The Draft Environmental Impact Report for the South Livermore Valley Specific Plan and General Plan Amendment states that the LOS for this intersection has improved to LOS A. It is believed that this upgrade of LOS was a result of improvements made to the local roadways and a reduction in the number of LLNL employees. Based on the improved LOS in the vicinity of Livermore and the reduced employment at LLNL, the project is not expected to contribute cumulative impacts to traffic.

#### *LLNL Transportation Practices*

Transported hazardous wastes must be in accordance with the LLNL On-site Packaging and Transportation Manual. This document summarizes all major on-site transportation procedures and requirements in a single comprehensive document. In most cases, DOE Orders and related requirements provide safety procedures equivalent to the DOT requirements for off-site shipments. These requirements include training for waste handling personnel, equipping transport vehicles with emergency response and general safety equipment, daily inspections of transport vehicles, segregation of wastes according to compatibility, identification of wastes with proper labeling, and packaging in tightly closed, approved containers that show no signs of damage, deterioration, or leaking.

These activities are organized into the following three areas of management to ensure health, safety, and environmental protection:

- ! **Containment.** Providing adequate containment of hazardous materials and wastes during each transfer to ensure no hazardous materials are released during normal on-site transport operations.
- ! **Communication.** Providing adequate communication to provide sufficient information to personnel handling hazardous materials and (if needed) to emergency responders.

- !     **Control.** Adherence to documented procedures and other administrative and/or physical control requirements appropriate for the level of containment and communication.

Compliance with DOE Orders and DOE regulations through appropriate packaging, use of qualified vehicles and drivers, and conduct of required vehicle inspections provides protection to LLNL workers and the public. Waste transportation routing is also designed to reduce exposure to the public. Therefore, transportation of mixed wastes will be less than a significant impact.

Facility operation plans that specifically address waste transportation will regulate each DOE facility. The plans will address appropriate equipment, maintenance and inspections, personnel training, surveillance of all loaded shipments, emergency preparedness, and communications equipment and services.

#### *DOE Low-level Radioactive Waste Shipping Practices*

The primary regulatory approach for ensuring safety during transport of radioactive wastes is by specifying standards for packaging. The DOT and NRC have the primary responsibility for regulating radioactive wastes (49 CFR Part 173 and 10 CFR Part 171), and the DOE has formal agreements to comply with these requirements. There are three levels of packaging for radioactive wastes:

1.     "strong and tight" - used for certain low-level, low-risk wastes (e.g., mill tailings). Examples are steel drums, metal bins and wooden boxes.
2.     Type A - used for low-level wastes. Does not require special handling or equipment. Must demonstrate that the packaging can withstand normal transportation. Examples are steel drums and metal bins.
3.     Type B - used for high-level, large quantity wastes (e.g., spent nuclear fuel) and intended to withstand accidents. An example is the large casks used for fuel transport. Requires special handling and protection equipment.

The radionuclide levels of all of the mixed wastes at LLNL are classified as low-level, so the wastes will be shipped in Type A packaging plus whatever requirements are necessary for proper management of the hazardous characteristics. Type A packaging will also be used for the transuranic waste (TRU) since its containers are "contact-handled." The containers will be 55-gallon drums or shipping boxes. Many of the wastes from LLNL will be labpacked into these containers, with enough absorbent to completely absorb any releases. Type A - packaged wastes are usually shipped on flatbed or covered trailers. The maximum "payload" for a truck is approximately 44,000 pounds (including the containers in which the waste is packaged).

Wastes from LLNL will be transported by truck. Truck carriers of radioactive wastes are required, whenever possible, to use circumferential interstate routes and routes that bypass populous areas, while minimizing traffic delays and transit times.

Based on the above analysis, the proposed project will not have a significant effect on transportation systems or circulation.

Findings:

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Less Than Significant Impact</i>	<i>No</i>
9	9	:	9

## 10. Public Services

Description of Environmental Setting:

The Livermore site operates its own fire station and an emergency dispatch center. All Livermore site health and safety alarms are received by the emergency dispatch center through the LLNL Livermore site alarms and dispatching personnel. The LLNL Fire Safety Division participates in several automatic and mutual aid agreements with various off-site agencies. Automatic aid is dispatched without request on a first alarm. Mutual aid assistance is specifically requested after local agency resources have been depleted. LLNL participates in automatic and mutual aid agreements with the City of Livermore Fire Department and the Alameda County Fire Patrol, respectively. (US DOE & UC, 1992, p. 4-32)

On-site police and security services at the Livermore site are provided by the Protective Force Division of the Safeguards and Security Department. It is the function of the Protective Force Division to provide protection of LLNL personnel and property. The group is responsible for controlling access to the site, surveillance monitoring, periodic foot and vehicle patrols, and responding to special incidences. (US DOE & UC, 1992, p. 4-37). LLNL participates in emergency response agreements with the City of Livermore Police Department, the Alameda County Sheriff's Department, the San Joaquin County Sheriff's Department, the State of California Highway Patrol, and the Federal Bureau of Investigation.

Water used at the Livermore site is purchased primarily from the City of San Francisco Hetch Hetchy Aqueduct system and from the Alameda County Flood Control and Water Conservation District, Zone 7 (US DOE & UC, 1992, p. 4-162). Electrical power is supplied to the main site by Pacific Gas and Electric Company (PG&E) and the Western Area Power Administration (US DOE & UC, 1992, p. 4-209). Natural gas is supplied to the main site by the Pacific Gas and Electric Company (PG&E). The City of Livermore Water Reclamation Plant (LWRP) handles sewage from the site.

The City of Livermore has a population of 65,000 residents with a total housing of 23,000 units. The total job market within the City of Livermore is approximately 27,900 jobs. Recreational activities within the city includes 40 parks, 2 public golf courses, 3 libraries, and several

wineries. LLNL, with its approximately 8,000 jobs, is a major employer in the City of Livermore. A major portion of these employees reside within the City of Livermore.

*Analysis of Potential Impacts:*

The project will result in a temporary increase of 15 to 20 workers during construction but will not require new personnel for operation. Since the increase in workers would be temporary and no increase in personnel will be needed for project operation, no significant increase to the Livermore population is expected. Therefore, no change to governmental services such as road maintenance, parks, recreational facilities, and schools are expected.

LLNL has its own fire protection services. LLNL also participates in aid agreements with the City of Livermore Fire Department, the Alameda County Fire Patrol, and the State of California Department of Forestry to serve the LLNL Livermore site. The proposed activities are not anticipated to have a significant increase in the need for interaction with off-site agencies. LLNL provides on-site security services and participates in emergency response agreements with the City of Livermore Police Department and Alameda County Sheriff's Department for additional police protection services. The proposed activities are not anticipated to require increased security.

Finally, please see discussion under item 12 of this Initial Study which concludes that impacts on water, electrical, gas, and sewer services provided by public agencies are less than significant.

*Findings:*

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Unless Impact</i>	<i>Less Than Significant</i>	<i>No</i>
9	9	:		9

## 11. Energy

*Description of Environmental Setting:*

Major energy sources used at the Livermore site include, electrical power, natural gas, and liquid fuel. Electrical consumption is approximately 328 million kilowatt-hours per year with a peak load of 57.2 megawatt-electrical. Natural gas consumption is approximately 14,160,000 cubic meters/yr, and liquid fuel (i.e., gasoline, diesel, etc.) consumption is approximately 31,688 liters/yr.

Analysis of Potential Impacts:

The proposed project is expected to use approximately 5 million kilowatt-hours per year in electrical consumption. In addition, approximately 180,000 cubic meters of natural gas is expected to be used. When compared to current totals for the site (328 million kilowatt-hours per year and about 14 million cubic meters per year for natural gas), the estimated energy consumption is not significant. Most of the power plants in the Western U.S. are connected by a network of power lines. This means that the power supplied by the network of power plants is combined so that the local power plant does not necessarily supply all of the power to the area around it. Based on the availability of numerous sources of electricity throughout the Western U.S., it is expected that PG&E would be capable of meeting LLNL's minor increase in energy demand and is therefore considered a less than significant impact.

Findings:

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Less Than Significant Impact</i>	<i>No Impact</i>
9	9	:	9

## 12. Utilities

Description of Environmental Setting:

LLNL consumes 0.7 million gallons of water per day through the Hetch Hetchy water system. The maximum amount of water LLNL could handle (consumption and storage) is 2.8 million gallons per day. The Hetch Hetchy system is capable of providing a total of 350 million gallons of water per day. An alternate backup source is Zone 7 of the Alameda County Flood Control and Water Conservation District (US DOE, FEIS/EIR, p. 4-207) which is capable of producing 24.9 acre feet (approximately 22 million gallons) of water per day.

Electrical power is supplied to the main site by Pacific Gas and Electric Company (PG&E) and the Western Area Power Administration (US DOE, FEIS/EIR, p. 4-209). The main site's current electrical consumption is approximately 321 million kilowatt-hours per year. This represents an estimated 3 percent of the total annual demand for residential, commercial, industrial and other consumers in Alameda County.

Natural gas is supplied to the main site by PG&E. Natural gas consumption is approximately 14,160,000 cubic meters per year and is used mostly for comfort heating in buildings and programmatic experimental use.

The City of Livermore Water Reclamation Plant (LWRP) currently receives a total of approximately 4.5 million gallons of effluent per day. The capacity of this facility was expanded in 1996 to 10 million gallons of effluent per day. The 5-year sewer discharge average for the

main site is 113.2 million gallons per year. There are four principal sources of large-volume batch discharges: cooling towers, boilers, and wastewater treatment/retention tanks.

*Analysis of Potential Impacts:*

Process and potable water will be provided to the DWTF, the Building 612 facility and Building 280. Water is used in the SRU (decontamination operations), container and tank rinsing, eyewash/safety showers, and fire sprinkler systems. It is expected that these operations will result in a minimal increase in water usage.

Electrical power will be used in the Hazardous Waste Management Facilities to power outlets, interior and exterior lighting, compressors for compressed air supply, HVAC equipment, and to also operate treatment and air pollution control equipment. It is anticipated that the increased demand for electrical power will be small.

Natural gas is used in the Building 612 facility for a natural gas fired boiler for the SRU. It is expected that the demand for natural gas will be small for this operation.

Wastewater effluent from DWTF operations would increase the combined LLNL and Sandia National Laboratory wastewater effluent between 366,000 to 700,000 gal/day by approximately 800 gal/day. This increase, when one considers the 10 million gal/day capacity of the City of Livermore Water Reclamation Plant, presents a less-than-significant cumulative impact (US DOE, 1996, p. 39).

*Findings:*

<i>Potentially</i>			
<i>Potentially</i>	<i>Potentially</i>	<i>Less Than</i>	
<i>Significant</i>	<i>Significant</i>	<i>Significant</i>	<i>No</i>
<i>Impact Mitigated</i>	<i>Unless</i>	<i>Impact Impact</i>	
9	9	:	9

### 13. Noise

*Description of Environmental Setting:*

Noise sources within the Livermore site include on-site vehicular traffic and stationary sources such as heating, ventilating and air conditioning equipment. Noise generated at the Livermore site is not subject to regulation by local governmental agencies, in this case the City of Livermore and County of Alameda. However, it is DOE and UC policy to cooperate with local agencies whenever feasible. Noise generated at LLNL is typical of a research and development facility, and is not in conflict with land use compatibility noise guidelines for the surrounding areas within the City of Livermore and County of Alameda (US DOE & UC, 1992, p. 4-181). LLNL maintains a Hearing Conservation Program to protect employees from harmful noise. This program involves identification of exposed personnel (monitoring), implementation

of noise-reducing engineering and administrative controls, use of hearing protectors (plugs, ear muffs), audiometric testing (baseline and annual), and employee training.

Off-site noise sources adjacent to the Livermore site include vehicular traffic along the roadways and occasional aircraft flybys (US DOE & UC, 1992, p. 4-182). In 1991, a survey of off-site noise was conducted by LLNL and concluded that the dominant off-site noise impact was vehicular traffic (US DOE & UC, 1992, p. 4-183).

The nearest off-site noise-sensitive receptors to the LLNL Livermore site include single-family residences east of Greenville Road, approximately 200 ft from the site's eastern boundary and a residential development west of Vasco Road, approximately 200 ft from its western boundary.

*Analysis of Potential Impacts:*

The proposed action would generate noise during both the construction and operation phases. During the construction phase, the main noise impact would occur from vehicles and heavy equipment. This impact would be relatively short in duration, approximately 2 years, and may lead to slightly higher noise levels in the Greenville Road area during business hours. However, since this noise increase would not exceed any regulatory limits, it would not pose a hazard to off-site receptors. Personnel involved with the construction would wear appropriate personnel protective equipment as necessary.

The DWTF and Area 612 Facility would contain several waste treatment units as well as heating, ventilation and air conditioning (HVAC) equipment, all of which may generate noise. The treatment units would be located within buildings which would effectively muffle any noise impacts to adjacent worker populations or off-site populations. The equipment would be monitored for noise emissions and administrative controls or personnel protective equipment used as necessary to avoid impact to involved workers. The exhaust and HVAC systems would not represent a significant noise level because they typically generate noise levels around 50 dB and would represent only a fraction of noise levels on and off-site.

Taking into account noise from the HVAC, vehicle traffic noise would continue to represent the main source of noise during the operation of the DWTF, Area 612 Facility and Building 280. The estimated volume of vehicles within the Area 612 Facility is two vehicles per hour. Traffic at the DWTF and Building 280 Facility is not expected to exceed two vehicles per hour. The speed limit within the Hazardous Waste Management Facilities is 15 mph. Therefore, traffic noise from the project operations would not result in an increase above existing background noise.

The City of Livermore has adopted noise level guideline in the *City of Livermore Community General Plan* Noise Element. Residential developments are considered "normally acceptable" where the noise level does not exceed an  $L_{dn}$  (day/night average for noise) of 60 dBA, "conditionally acceptable" between 60 and 70 dBA, and "normally unacceptable" between 70 and 75 dBA. In the last two categories, new construction or development should occur only after a detailed analysis of the noise reduction requirements and including the needed noise insulation

features in the design. These guidelines provide a basis for determining exterior noise environments acceptable for new residential developments.

According to the 1992 EIS/EIR, monitoring stations setup outside LLNL showed traffic noise levels under the 70 dBA. This level is considered acceptable by both the City of Livermore and the County of Alameda. Because the amount of traffic is not expected to increase substantially, the off-site noise levels should remain within the 70 dBA noise limit.

Findings:

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Less Than Significant Impact</i>	<i>No Impact</i>
9	9	9	:

## 14. Public Health and Safety

Description of Environmental Setting:

LLNL currently manages hazardous waste in Building 233, Building 693, Area 612 and Area 514. Building 233 is used to for container storage of hazardous waste solids only. Building 693 is currently being used for container storage of solid, liquid, and gaseous hazardous and mixed waste. The Area 612 Facility consists of 11 storage units and 2 treatment units, all of which are operating under interim status and are proposed for continued operation under the proposed project. The Area 514 Facility is where most of the hazardous waste treatment currently occurs. This facility consists of the Wastewater Treatment Tank Farm, the Quadruple Tank Unit (used for storage of aqueous waste), filtration units (also known as the Dorr-Oliver), an Evaporation Unit, a Portable Blending Unit, a Tank Blending Unit, a Centrifugation Unit, Building 513 (location of Solidification Unit, Shredding Unit, and a Container Storage Unit), and Area 514-1, 514-2, and 514-3 Container Storage Units. In the proposed project, the Area 514 Facility will be closed and replaced by Building 695. Under interim status, the total amount of waste that can be stored in the storage units is 808,714 gallons (includes solid waste) and the total amount of liquid and solid waste that can be treated is 9,000 gal/day and 72.5 short tons/day, respectively.

These existing hazardous waste management units are located within the perimeter of LLNL's 823 acre property in the City of Livermore. LLNL's perimeters consist of rural areas dominated by agricultural use and open space. Property to the south includes agricultural areas, low-density residential areas, and Sandia National Laboratory which is also surrounded by DOE-owned land. To the west, a mixed density, single-family residential subdivision begins and extends south and west. Property to the east is agricultural land and low-density residential development. A parcel of open space and agricultural land (287 acres) has recently been rezoned to allow development of a center for heavy industry. To the north is a light-industrial park. DOE has acquired

additional land along the western and northern boundaries of the Livermore site to serve as a buffer zone.

*Analysis of Potential Impacts:*

If approved, the project will allow continued operations at the Area 612 Facility, operation of new storage units (B280, B693 Annex, B693 Yard Freezer, and B693 Yard Roll-off Bin), and construction of new treatment and storage facilities within the DWTF.

Under the proposed project, Building 233, which currently poses seismic and worker safety concerns, will be replaced by Building 280. Building 280 was specifically selected to replace Building 233 because it meets the UBC seismic standards and is designed for radiological protection being originally designed to house a nuclear reactor. Units within the Area 612 Facility is proposed for continued operation under the project. Hazardous waste management activities in this area will essentially remain the same and involve receiving, segregation, repackaging, and storage of waste. Except for the continued operation of the Drum/Container Crusher and the Size Reduction Unit, no new treatment operations are proposed in this area. Building 693, which is part of the DWTF, is another unit that is proposed for continued operation under the project. Additional storage units that will also be added in the vicinity of Building 693 include the Building 693 Annex, the Building 693 Yard Freezer, and the Building 693 Yard Roll-off Bin.

The project also proposes to construct a replacement for LLNL's current liquid waste treatment facility at Area 514. The replacement units will be located in Building 695 which will be constructed as part of the DWTF. Features in Building 695 that make it an improvement over the existing A514 Facility include the use of closed instead of open top tanks, installation of carbon adsorption systems and HEPA filters to capture volatile organic emissions and particulates, respectively, replacement of inefficient units such as the Dorr-Oliver, and the capability to treat smaller batches of waste using specifically designed treatment trains.

Based on the design capacities of the units and results of the health risk assessment, the permit will allow a total of 808,000 gallons (includes solid waste) of waste to be stored in the storage units. This storage capacity is about the same as LLNL's currently allowed capacity of 808,714 gallons under interim status. The permit will also allow a total amount of 57,720 gal/day of liquid waste to be treated up to an annual limit of 382,750 gal/year and 16.1 short tons per day (st/day) of solid waste up to an annual limit of 1,433 st/yr. In comparison, the units under interim status are allowed to treat a maximum of 16,260 gal/day of liquid waste and 100 st/day of solid waste with no annual limits. Due to more stringent limits on the amounts of waste stored and treated and the replacement of older units with more efficient ones, the proposed project is expected to result in safer waste management practices.

*Administrative and Engineering Controls*

However, there would still be a potential risk posed by the treatment and storage of hazardous waste, mainly being the exposure of workers or the public to hazardous and/or radioactive air

emissions. Exposure of people to health hazards can occur during normal operations or in the event of an accident. Potential hazards include, but are not limited to, exposure to toxic air emissions or radionuclides, contact with hazardous or mixed waste in the event of a release, and impacts due to a fire or an explosion. Due to the potential risk posed by waste management activities, various engineering design measures and administrative controls have been incorporated in the project to reduce the probability of an accident from occurring and to mitigate the level of subsequent consequences once an upset occurs.

LLNL provides engineering controls, including:

- C bermed containment areas (concrete berms and frustrums)
- C fire protection systems (automatic sprinkler systems or portable fire extinguishers)
- C fire alarms and communication systems
- C HEPA-filtered local ventilation systems
- C scrubber off-gas systems
- C natural ventilation systems
- C automated chemical reagent delivery systems
- C personal protective equipment including respirators and protective clothing
- C building construction based on structural specifications and safety design
- C use of closed waste containers
- C electric interlocks
- C emergency shut-off controls
- C maintenance systems
- C use of waste handling equipment with safety features
- C fenced areas equipped with gates that are kept locked
- C barriers and signs to alert personnel to hazards

LLNL also uses administrative controls, including:

- C inventory control
- C radiation monitoring systems, including portable radiation monitors, continuous air monitors, and devices worn by personnel
- C pre-operational inspections of treatment systems
- C review of waste treatment plans by qualified personnel prior to treatment
- C personnel training
- C operating procedures
- C programs such as the ALARA (As Low As Reasonably Achievable) Program, Carcinogen Control Program, and Hazards Evaluation Program

It is expected that, institution of the above engineering and administrative controls, would result in a low probability of exposure to hazards and would mitigate the potential impacts in the event of accident to a less than significant level. Potential impacts in the event of an accident are further mitigated by the implementation of LLNL's Contingency Plan (see Risk of Upset section under item #8 of this Initial Study for a description of emergency procedures). The Contingency Plan establishes individual responsibilities during emergencies and provides procedures for

responding to fires, spills, earthquakes, and equipment failure. LLNL's Hazardous Waste Management (HWM) Division employees are trained in proper response actions and in the use of emergency equipment commensurate with their jobs. Mutual aid agreements that cover fire, medical, rescue and radiation emergencies are in place between LLNL and the following agencies: Alameda County (Medical Response), Alameda County (Fire Service Operational Plan), Valley Memorial Hospital (Radiation Emergency), State of California Office of Emergency Services, UC Davis (Applied Science Department-LLNL Building 661), City of Livermore (Automatic Aid Agreement), City of Tracy, UC and State of California (Master Mutual Aid Agreement), and Twin Valley Mutual Aid.

### *Health Risk Assessment*

LLNL has prepared a Health Risk Assessment (HRA) for the proposed project in accordance with the procedures and guidelines set forth by DTSC and BAAQMD. The objective of the HRA was to evaluate the potential cancer risk and the non-cancer health effects associated with the project. The HRA involved a number of steps, beginning with the characterization of the sources of potential risk. The hazardous waste management facilities were evaluated with regard to their potential to produce atmospheric emissions. Two facilities were identified as sources: the DWTF Facility and the Area 612 Facility. Each of these two facilities has both a "stack" emission point and a general "area" emission source. Thirteen waste treatment units were evaluated for their contribution to emissions, and maximum throughput capacities were established. Each treatment unit was evaluated in terms of its air emission abatement equipment, such as HEPA filters, and carbon adsorption, which reduce atmospheric emissions from the facilities.

### *Methodology for Calculating Carcinogenic and Non-carcinogenic Risks*

Air dispersion modeling was used to evaluate the distribution of air emissions of chemicals and radionuclides from the DWTF stack, the Building 612 stack, and the DWTF and Area 612 Yard area sources. Five years of meteorological data from the LLNL meteorological station was used as input to the models. Exposures to actual receptors were modeled at 56 discrete locations, and exposures to hypothetical receptors were modeled at 441 locations. This modeling provided information on the relative concentrations of chemicals at any receptor location. Exposure scenarios were defined for categories of residential, adult-worker off-site/on-site, and youngsters at a child daycare center. Exposures to chemical concentrations in air, soil, and homegrown produce were evaluated for inhalation, ingestion, and dermal absorption pathways. Potential cancer risks and non-cancer risks were calculated for the receptors of interest.

The HRA identified five Maximally Exposed Individual (MEI) receptors and developed a scenario for each to evaluate potential human exposure to chemicals released from the DWTF and the Area 612 Facility. The five receptors include an adult worker off-site located in a commercial facility approximately .43 mile north of the DWTF (MEI<sub>awo</sub>); an adult working at LLNL (MEI<sub>aos</sub>); an individual living at an existing residence approximately .5 mile east of LLNL (MEI<sub>RESreal</sub>); an individual living at a hypothetical residence located approximately .25 mile east of the DWTF in the region of maximum predicted concentrations of chemicals emitted from the

DWTF ( $MEI_{REShyp}$ ); and a youngster at a hypothetical child daycare center in the residential suburb approximately 1 mile west of Area 612 ( $MEI_{cdc}$ ). Two principal assumptions used in the exposure scenarios are that: 1) LLNL will continue to be operated as a U.S. DOE facility, and 2) Waste handling and treatment in the DWTF and the Area 612 Facility will take place over a 30-year period (the approximate predicted operational lifetime of the planned facilities). Both the  $MEI_{RESreal}$ ,  $MEI_{REShyp}$  were assumed to reside, eat homegrown produce, and have dermal contact with soil at the point of maximum concentration from birth up to 30 years. The adult on-site receptor or  $MEI_{awo}$ , is assumed to be exposed by direct inhalation and ingestion of vegetables at an exposure frequency equal to 2,000 hours per year (based on 8 hours per day, 5 days per week, 50 weeks per year) for 25 years. For the child exposure scenario, the  $MEI_{cdc}$  is assumed to receive exposure by direct inhalation only for six years at a frequency of 2,000 hours per year.

### *Carcinogenic and Non-carcinogenic Risk Estimates*

In risk assessment, government agencies recognize that cancer risks less than  $1 \times 10^{-6}$  are not significant for the purpose of requiring additional, health-related mitigation measures. Generally, this level constitutes a de minimis risk, or one that is so small as to be effectively no risk. The Federal Food and Drug Administration has made such a finding in the context of cancer risks from food additives. It should be noted that this does not mean that one out of a million people would contract cancer, but rather that there is an additional one-in-a-million chance over a person's normal risk of developing cancer over his or her lifetime. For non-cancer risks, if the sum of the hazardous quotients for the chemicals of concern and relevant exposure routes is less than one, the exposure is acceptable and no further action is required from a human health risk perspective.

In all cases, risk and hazard were evaluated at the maximum anticipated operating levels, so that the risk and hazard estimates represent upper-bound values. This risk assessment found that the cancer risk to the  $MEI_{RESreal}$  (maximum exposed individual at the real residential location) is  $5 \times 10^{-7}$ , and the cancer risk to the  $MEI_{REShyp}$  (hypothetical residential) is  $7 \times 10^{-7}$ , both of which are acceptable risk levels from a regulatory perspective. The cancer risk for the three other receptors,  $MEI_{awo}$ ,  $MEI$ , and  $MEI$  were even lower than the risk for the  $MEI_{REShyp}$ . The non-cancer risks estimated for all five selected MEIs, expressed as hazard quotients, ranged between .00047 to .022, where 1 is considered acceptable exposure. Therefore, since all non-cancer risks were below 1, all MEIs are considered to be exposed to acceptable levels.

### *Radiological Dose and Risk*

The radiological dose was calculated using and US EPA approved air dispersion model which estimates average dispersion of radionuclide releases from either continuous point sources or continuous uniform area sources. Assessments are done for a polar grid of distances and directions for a radius of 80 km (50 mi) around the source. Sources assessed include the stack at the DWTF and the stack associated with the SRU. Two area sources were also considered: the area source associated with Area 612 waste transfer activities, and the area source associated with proposed DWTF waste transfer activities. Specific doses were calculated for each treatment unit and handling operation. Doses reported in the assessment are for the location of

maximum annual effective dose equivalent (EDE) off-site and assume 24-hour-per-day exposures for 365 days per year. To estimate lifetime excess cancer mortality risk associated with maximum exposure to radionuclides, the assessment assumed that the doses calculated were received by an individual who resides at the fenceline of LLNL for 30 years. (HRA, 1997, Vol. 1, pp. VIII-1 to VIII-3)

The NESHAPs regulations limit the emission of radionuclides to the ambient air to activity levels resulting in an EDE not to exceed 10 mrem per year. The combined, annual maximum off-site EDE estimated for the DWTF stack and area source is .0043 mrem/yr. The combined, annual maximum off-site EDE estimated for the Area 612 area source and SRU stack is .0041 mrem/yr. Although the doses are not additive, for comparison purposes, these estimated doses were added together and combined with existing radionuclide emissions from the site and compared with the limit of 10 mrem/yr. As stated under the Air Quality section of this Initial Study under item #2, adding the estimated radionuclide emissions from the project to existing site data would result in a total maximum EDE of 0.18 mrem/yr which would still remain well below the regulatory limit of 10 mrem/yr. (HRA, 1997, Vol. 1, p. VIII-3)

As for radiological cancer risk, the same standard of  $1 \times 10^{-6}$  can be applied to determine whether the cancer risk from radionuclides is acceptable. The radiological cancer mortality risk to the nearest MEI (the hypothetical residence) was estimated to be  $6 \times 10^{-7}$  (LLNL, HRA, 1997, Vol. 1, Executive Summary, p. 2). This estimate is below the standard of  $1 \times 10^{-6}$  and is therefore considered an acceptable risk level.

Therefore, health impacts associated with exposure to radionuclides from the project poses a less than significant impact.

#### *Other Impacts*

Normal construction hazards will be present during the construction phase for the DWTF. However, workers will receive proper safety training prior to construction and all activities will be in accordance with relevant Occupational Safety and Health Act requirements. Closure activities for the Area 514 Facility must also be conducted according to a DTSC approved Closure Plan which would address public and worker safety. Therefore, construction activities are not expected to significantly impact public health and safety.

Transportation hazards, as discussed under item #9 of this Initial Study, are expected to have a less than significant impact due to stringent handling and packaging requirements and the negligible amount of vehicles used for off-site shipments per month.

#### *Conclusion*

In summary, the hazardous waste management activities would not significantly change at LLNL except that better designed buildings and more efficient equipment will be used. Various engineering and administrative controls incorporated into the project as well as permit conditions which put limitations on treatment and storage capacities are all designed to prevent upset

conditions or to mitigate the consequences in the event of an accident. The potential risk due to chronic exposure to air emissions from the proposed waste management facilities were also shown to be at acceptable levels. Therefore, minimal impacts to public health and safety are expected from the proposed treatment, storage, and/or transport of hazardous waste at LLNL.

Findings:

	<i>Potentially</i>	<i>Potentially</i>	
<i>Potentially</i>	<i>Significant</i>	<i>Less Than</i>	
<i>Significant</i>	<i>Unless</i>	<i>Significant</i>	<i>No</i>
<i>Impact Mitigated</i>	<i>Impact</i>	<i>Impact</i>	
9	9	:	9

## 15. Aesthetics

Description of Environmental Setting:

The Livermore site is a well developed site characterized by numerous buildings set within landscaping. The buffer zones to the north and west are primarily mowed grasslands. The view into the Livermore site from the east and the south is buildings or fenced areas.

Analysis of Potential Impacts:

The proposed action would result in the construction of the DWTF consisting of Buildings 694, 695, 696, and 698. These new buildings would be constructed on 5.5 acres of LLNL's 823 acre property and would be aesthetically similar to the existing buildings on-site. All other construction resulting from the project would occur within buildings or existing areas already containing equipment. Therefore, the view of the Livermore site consisting of buildings and fenced areas would not change. The change to the overall appearance of the site is considered minor and would not result in a degradation of aesthetic values to either the Livermore site or the surrounding area.

Findings:

	<i>Potentially</i>	<i>Potentially</i>	
<i>Potentially</i>	<i>Significant</i>	<i>Less Than</i>	
<i>Significant</i>	<i>Unless</i>	<i>Significant</i>	<i>No</i>
<i>Impact Mitigated</i>	<i>Impact</i>	<i>Impact</i>	
9	9	9	:

## 16. Cultural/ Paleontological Resources

### Description of Environmental Setting:

According to Jamie Bennett, LLNL's archeologist, no known prehistoric archeological remains have been reported for the Livermore site. An archival (literature) search of the California Archeological Inventory at Sonoma State did not turn up any known recorded remains within the Livermore site. In accordance with Section 106 of the National Historic Preservation Act and CEQA, cultural resource studies were recently conducted. Seven sites have been recorded in the Pleasanton-Livermore area. Only five of these have undergone any degree of excavation. Consequently, the nature of early occupations is not clearly understood because of an inadequate amount of data. No ethnographic sites have been reported within the boundaries of the LLNL site. The historic value of the LLNL site must be determined as part of DOE's responsibility to comply with Section 106 of the National Historic Preservation Act. This process would include an evaluation of whether portions of the site are eligible for the National Register. As such, only Building 514 may qualify for listing on the National Register of Historic Places. This building was an engine test pad where one of the world's first jet engines was tested. (U.S. DOE & UC, 1992, p. 4-46 & Appendix H)

### Analysis of Potential Impacts:

Though prehistoric sites have not been discovered at LLNL, an archaeologist will be consulted if a deposit of probable significance is unearthed during construction of the proposed project. If the find is determined to be significant, appropriate mitigation measures will be formulated and implemented prior to continuing further construction activity. The project will involve modifications to the Area 612 Facility and not the Area 514 Complex where Building 514 is located. Therefore, the project will not pose any impacts to the National Register's evaluation of the historic value of Building 514.

### Findings:

<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Less Than Significant Impact</i>	<i>No</i>
9	9	9	:

## 17. Cumulative Effects

### Description of Environmental Setting:

The LLNL Livermore site is bordered on the east by Greenville Road. The property east of Greenville Road is agricultural with a few scattered rural residences and is used primarily for grazing. Patterson Pass Road runs along the northern boundary of the LLNL Livermore site. Across Patterson Pass Road to the north is a light-industrial park. A Union Pacific Railroad line

runs in an east-west direction along the northern boundary of the industrial park. Land uses farther north include vacant land, industrial uses, a Southern Pacific Railroad line, an abandoned outlet shopping mall, and Interstate 580. Land northeast of the site is agricultural and is used primarily for grazing. On the west, the LLNL Livermore site is bordered by Vasco Road. A low-density, single-family residential subdivision begins at the southwest corner of Patterson Pass Road and Vasco Road and extends south and west. The property to the south and adjacent to LLNL along East Avenue is Sandia National Laboratory (SNL). SNL performs engineering research and development for all levels and phases of the nuclear-weapons life-cycle. SNL also performs tasks related to national security, including nuclear materials safeguards and security, treaty verification and control, intelligence on foreign technologies and weapons systems, waste management, and programs in support of the Department of Defense. The primary land uses surrounding SNL are rural residential and agricultural. Approximately 50 acres immediately to the south of SNL are cultivated in vineyards. The agricultural lands south of Tesla Road and west of Greenville Road are also cultivated in vineyards. (US DOE & UC, 1992, pp. 4-3 & 4-5).

Proposed developments in the vicinity of LLNL Livermore site include the following:

- ! Housing development - Signature Properties is continuing development of property as residential housing along Vasco Road between Daphne Drive and Mesquite Way. The development is currently in Phase 3, known as Coventry Homes. Approximately half of the permitted total of 453 single family dwellings have been built. The building is in a slowdown mode due to economic factors. The Livermore Planning Department does not know the schedule for completion but assumes that it will be no more than seven years.
- ! Industrial Park - A site which is zoned industrial, located off Greenville Road, approximately 1 mile north of LLNL, is being developed for industrial use. Construction started in 1997. Included in this industrial park is a 600,000 ft<sup>2</sup> warehouse facility which will be occupied by Circuit City. The City of Livermore Planning Department says that the construction schedule cannot be predicted. Additional buildings consisting of offices, warehouses, etc., will also be built.
- ! Garre Winery - This is a proposed 22 acre development consisting of buildings for wine storage, wine tasting, and a restaurant. It will be located on the northwest corner of Greenville Road and Tesla Road. Construction of the winery portion will begin summer of 1997. The Alameda County Planning Department is changing the zoning for the 22 acre parcel to allow construction of the deli and restaurant which will be built in about two years. Entire development is expected to be completed by the year 2002.
- ! Mobile Home - This project involves the addition of a mobile home at an existing 17.3 acre property located on 4224 Greenville Road (east side corner southeast of Tesla Road). The existing property consists of barns, an equestrian center, and other structures. The mobile home will be used as a temporary residence for the caretaker. The Alameda County Planning Department is processing a Conditional Use Permit (CUP) to allow for the addition of the mobile home because the zoning for that parcel only allowed for one residential dwelling. Addition of the mobile home will require installation of utility systems for

electricity, water, and sewer. Since building permits still need to be obtained, the date of installation is unknown.

In 1992, the UC certified a comprehensive EIR for continued operation of LLNL for the period 1992-2002. This EIR estimated the potential impacts of near-term (5-10 year) proposed new facilities on-site. New LLNL facilities which have been completed and have been operating since its evaluation in the 1992 EIR/EIS include the following:

- ! Atmospheric Emergency Response Facility - The project's name has been changed to the National Atmospheric Release Advisory Center (NARAC). Project construction was begun in 1993 and has been completed. It is an approximately 40,000 ft<sup>2</sup> office-type building for administrative use that houses the Atmospheric and Geophysical Sciences Division, which conducts atmospheric research. It generates no hazardous wastes and only minimal quantities of other types of wastes.
- ! Nuclear Test Technology Complex (NTTC) - The NTTC (Building 132S) is an existing facility and was under construction at the time of the 1992 EIR certification. The building is already occupied and construction is considered essentially complete. The NTTC consists of offices and light laboratories and is designed to accommodate approximately 400 workers who conduct research and development in areas such as plasma physics, x-ray imaging and photoconductive detection, and x-ray spectroscopy. These laboratories and staff also support the design and fabrication of diagnostic test components. NTTC operations generate small amounts of liquid hazardous wastes, primarily in the form of photographic processing solutions and volatile organic solvents used in equipment cleaning operations. Waste generated from B132S are currently being handled by LLNL Waste Management Facilities as a routine, ongoing activity.
- ! Defense Programs Research Facility (DPRF) - The DPRF (Building 132N) is also an existing facility that was under construction at the time of certification of the 1992 EIR certification. The Building is designed to house approximately 300 employees and is already being occupied; construction is considered essentially complete. DPRF supports a variety of engineering and development, analytical chemistry, and weapons non-proliferation research activities. All wastes generated from B132N are currently being handled by LLNL Waste Management Facilities as routine, ongoing activities. Most of the activities being conducted in both Buildings 132S and 132N are those that have been simply moved to these more modern replacement facilities from older, scattered buildings and trailers.

New facilities that have been proposed for construction within the LLNL site since the 1992 EIR include the following:

- ! National Ignition Facility (NIF) - Construction of the NIF began around July 1997 and is scheduled to proceed through 2003 when NIF operations will begin. NIF is a \$1.2-billion laser facility the size of a football stadium consisting of a laser system and optical components, a target chamber, and computer control system all in an environmentally controlled building. The laser, consisting of 192 beams to deliver 1.8 million joules and

"ignite" small fusion targets, will be the world's largest optical instrument. The new laser will be the latest in a series of high-power laser facilities used for research in inertial confinement fusion. Over 75% of the project's \$1.2 billion cost will be spent on construction and manufacturing. This intense effort will create over 6,000 jobs around the country, including 2,800 in the San Francisco Bay area. The 1996 DOE Stockpile Stewardship and Management Programmatic Environmental Impact Statement estimated that the NIF facility could produce a maximum 706 ft<sup>3</sup> of waste (hazardous, low-level and mixed) per year.

- ! Protection of Real Property (Roofs), Phases I and II - The three phases of this project would provide for the replacement of roofs to as many as 15 buildings at LLNL. Many of the roofs on these buildings have the potential to be considered hazardous, radioactive or mixed. However, all the radioactive and hazardous waste generated from the proposed reroofing activities would be shipped directly from the construction site to an off-site disposal facility. Any mixed waste encountered, a small percentage, would either be sent directly to a commercial off-site facility or stored on-site.
- ! Isotope Science Facility - Plans include adding 22,000 ft<sup>2</sup> to Building 151 for office space. Preliminary design work would begin in FY 99 if funded by DOE. Other elements included in this proposed project are modifications to the existing building ventilation and mechanical systems and decontamination of any contaminated portions of the 56,351 ft<sup>2</sup> Building 241 Laboratory facility. Building 151 will remain a "low hazard" facility. Building 241 decontamination could be expected to produce chemically hazardous wastes, but in unknown quantities at this time since the levels of contamination (within hard-to-reach areas that would need to be sampled after building operations cease) are not known. This decontamination project would not start until at least the year 2001.
- ! Building 543 Addition - This project would construct a 2-story, approximately 30,600 ft<sup>2</sup> addition to B543. The addition will house new office spaces. No activities proposed for this addition would generate significant quantities of hazardous materials or waste.

As specified under Section 15130 or the CEQA guidelines, the above list of projects provided above is not meant to be a comprehensive list of all projects inside LLNL or its vicinity but has been determined to be those projects which may produce related or cumulative impacts as discussed in the analysis below.

#### Analysis of Potential Impacts:

As indicated above, new and future facilities/upgrades at LLNL may result in an increase in the amount of hazardous and/or mixed waste to be treated and/or stored in the DWTF, Area 612 or Building 280. However, due to the uncertainty of the funding status of existing programs and new facilities from year to year in response to changing funding levels and programmatic needs, it is more likely that waste generation from new programs would be offset by canceled new facilities and the end of other existing programs. As a result, no significant increases in hazardous and/or mixed waste generation are expected. Therefore, LLNL expects to be able to handle future increases in waste generation with the proposed hazardous waste management

facility and should, therefore, not lead to a larger or a series of additional hazardous waste projects in the near future.

The 1992 EIR/EIS anticipated an increase of 2050 in personnel over 10 years. At the time that the 1992 EIS/EIR was prepared, LLNL's total workforce (which include UC and DOE employees and contractors) at the Livermore site was 11,200. As of July 26, 1996, the total workforce for the Livermore site was 8,700. In April 1996, LLNL began implementation of a Voluntary Separation Incentive Program (VSIP) which further reduced the UC LLNL workforce.

The current workforce is approximately 8,440. By 2005, it is estimated that the Livermore site workforce will be approximately 8,150 (taking into account the jobs created by the NIF project). As a result of this overall trend, the workforce is being shifted and redistributed as necessary to reflect the programmatic changes and needs of the Laboratory. Therefore, the proposed project along with other projects within LLNL will not create new demands for additional housing nor impact the density or growth rate of the human population of the Livermore area.

New construction and/or upgrades as a result of the proposed project along with other projects within LLNL are not expected to have significant cumulative impacts on the topographic contours, slopes and soil characteristics of the main site because all construction activities will be conducted on relatively flat foothills that have been highly disturbed in the past by farming and subsequent military use. No significant cumulative impacts to the potential geologic vulnerabilities of the main site to landslides and faults are also expected since all buildings and facilities proposed at LLNL, including retrofits, would be built or modified according to established seismic design criteria based on their hazard ranking and location. Engineering and administrative measures would be taken to anticipate and prevent releases of hazardous substances resulting from strong ground shaking at any given facility (US DOE & UC, 1992, p. 5-60).

Cumulative short-term impacts to air quality may result from construction-related emissions generated from earth moving, excavation, and grading, and exhaust emissions from powered construction equipment and motor vehicles. Emissions would consist of particulates from dust generation, volatile organic compounds from paints and asphalt used for construction, and oxides of nitrogen from vehicular traffic. Emission levels would vary with the type of equipment, duration of use, operation schedules, and number of construction workers. These impacts are temporary and localized to the area of construction, and therefore would pose less than significant cumulative impacts.

Emissions due to present and future operations within LLNL and in the vicinity would be subject to the permit requirements of the BAAQMD. Regulations applying to various operations are adopted by BAAQMD as part of a plan to meet state and federal air quality standards. Compliance of LLNL and other projects with BAAQMD's permit requirements would ensure that cumulative impacts to air quality within the San Francisco Bay Area Basin is within acceptable levels.

The 1992 EIS/EIR described the level of service for the East Avenue/South Vasco Road intersection (which is the major intersection serving the Livermore Main Site) as level of service

(LOS) B. LOS is defined as a percentage of volume over capacity of a given roadway. This relative value for this intersection indicates that the volume of traffic was approximately 60 percent of the rated capacity. The Draft Environmental Impact Report for the South Livermore Valley Specific Plan and General Plan Amendment states that the LOS for this intersection has improved to LOS A. It is believed that this upgrade of LOS was a result of improvements made to the local roadways and a reduction in the number of LLNL employees. Based on the improved LOS in the vicinity of Livermore and the reduced employment at LLNL, the project is not expected to contribute cumulative impacts to traffic.

Like a small town, LLNL has many of its own services such as police, fire, and medical departments. Cafeteria, banking, and limited shopping services are also available on-site. Scientific support organizations such as Physics, Engineering, Computation, and Chemistry and Materials Science provide assistance to various LLNL programs, while institutional support organizations provide the services needed to operate LLNL. These services include plant maintenance and construction, and technical information services. Institutional support organizations also provide security, administer occupational safety, protect employee health, and minimize the impact of LLNL operations on the environment and the public. Due to the on-site services provided by LLNL, the proposed project and future programs at LLNL would not add to the cumulative demand for off-site services needed by planned and approved projects in the area.

The proposed project would contribute to the cumulative demand for solid waste disposal service associated with planned and approved projects in the area. LLNL sends solid waste to the Vasco Road Sanitary Landfill. Alameda County authorities project the existing capacity of this landfill at 17 years and has plans to expand the landfill to increase its lifespan by 12 more years (US DOE & UC, 1992, p. 5-37). In addition, the County of Alameda also has plans to site a new landfill in Eastern Alameda County. With existing, planned, and proposed landfill capacity in Alameda County, this is a less than significant impact.

The analysis under items #11 and #12 of this Initial Study showed that the proposed project would use negligible amounts of water, electricity and fuel compared to the total consumption at the main site. Therefore, the proposed project is not expected to contribute to the cumulative demand for such utilities by planned and approved projects in the area.

The development of approved and proposed projects near the LLNL site would result in increased toxic air contaminants due to stationary sources. Although the specific development plans that would lead to increases in toxic air contaminants due to the proposed projects are not known at the time of this Initial Study, any increases in toxic air contaminant emissions would be regulated under AB2588. Since this regulation requires that the human health risk from toxic air contaminant emissions be at acceptable levels, the increase in toxic air contaminant emissions due to approved and proposed projects is considered less than significant.

The only known potential sources of radionuclide emissions in the Livermore area are LLNL and SNL. In October 1996, US EPA reviewed SNL's 1996 NESHAPs Monitoring Report. The report documented that monitoring of stack emissions from the decommissioned and decontaminated Tritium Research Laboratory results in a modeled dose to the public of  $1.4 \times 10^{-7}$

<sup>5</sup> mrem effective dose equivalent. Based on this result, SNL is no longer required to perform stack emissions monitoring or prepare annual NESHAP reporting. As for LLNL, radionuclide data from 1990 to 1997 showed that the annual effective dose monitored at the site has remained well below the regulatory standard of 10 mrem/yr and will remain within this standard considering the proposed project. Since both SNL and LLNL radionuclide emissions are well below regulatory standards, no significant cumulative impacts are expected.

The proposed action was also shown to contribute no impacts to plant and animal life, land use, natural resources, noise, aesthetics, cultural/paleontological resources, population, housing and recreation. Due to the absence of any identified impacts on these environments, there are no impacts posed by the project that can be taken cumulatively.

Findings:

	Potentially Significant Unless Impact Mitigated	Potentially Significant Unless Impact	Less Than Significant Impact	No Impact
	9	9	:	9

## 18. Population/Housing/Recreation

Description of Environmental Setting:

The City of Livermore has a population of 65,000 residents with a total housing of 23,000 units. The total job market within the City of Livermore is approximately 27,900 jobs. Recreational activities within the city includes 40 parks, 2 public golf courses, 3 libraries, and several wineries. LLNL, with its approximately 8,000 jobs, is a major employer in the City of Livermore. A major portion of these employees reside within the City of Livermore.

Analysis of Potential Impacts:

The proposed action would not result in an increase in employment at the Livermore site since LLNL would utilize its internal labor force to operate the project. However, there will be a temporary increase of between 15 to 20 workers during construction of the project. Since there are already 8,000 employees working at the site, this increase is considered less than significant. Therefore, the proposed action would not have any impacts to the population of the surrounding community or the Livermore site, and would not impact the local housing market or recreational opportunities.

Findings:

	Potentially Significant Unless Impact Mitigated	Potentially Significant Unless Impact	Less Than Significant Impact	No Impact

9 9 9 :

## 19. Mandatory Findings of Significance

	<i>Potentially Significant Impact Mitigated</i>	<i>Potentially Significant Unless Impact</i>	<i>Potentially Significant Less Than Significant Impact</i>	<i>No</i>
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	9	9	9	:
b) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	9	9	9	:
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	9	9	9	:
d) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	9	9	9	:

#### ***V. DETERMINATION OF DE MINIMIS***

On the basis of this Special Initial Study:

- : I find that there is no evidence before the Department that the proposed project will have a potential for an adverse effect on wildlife resources or the habitat upon which the wildlife depend. A NEGATIVE DECLARATION with a DE MINIMIS IMPACT FINDING will be prepared.

#### ***VI. DETERMINATION OF SIGNIFICANT EFFECT***

On the basis of this Initial Study:

- : I find that the proposed project COULD NOT have a significant effect on the environment. A NEGATIVE DECLARATION will be prepared.
- 9 I find that although the proposed project COULD HAVE a significant effect on the environment, mitigation measures have been added to the project which would reduce these effects to less than significant levels. A NEGATIVE DECLARATION will be prepared.
- 9 I find that the proposed project COULD HAVE a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT will be prepared.

\_\_\_\_\_  
James Stettler, Project Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
James M. Pappas, Branch Chief

\_\_\_\_\_  
Date

ATTACHMENT A  
SPECIAL INITIAL STUDY  
REFERENCE LIST

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1. (BAAQMD, 1991) Bay Area Air Quality Management District, *Status of the Bay Area Air Quality Management District, Toxic Air Contaminant Control Program*, Volumes 1 & 2, August 7, 1991.
2. (DTSC, 1996) Department of Toxic Substances Control (DTSC), *Initial Study for Modified Proposed Site Treatment Plan for Mixed Waste, Lawrence Livermore National Laboratory*, September 23, 1996.
3. (FEMA, 1986) Federal Emergency Management Agency (FEMA), *Flood Insurance Rate Map (FIRM), Alameda County, California (Unincorporated Areas)*, National Flood Insurance Program, Panel 210 of 325, Community Panel Number 0600010210B, February 19, 1986.
4. (LLNL, HRA, 1997) Lawrence Livermore National Laboratory, *Health Risk Assessment (HRA) for Hazardous and Mixed Waste Management Units at Lawrence Livermore National Laboratory*, February 1997.
5. (Towse & Carpenter, 1986) Towse and Carpenter, *Geology of the LLNL Decontamination and Waste Treatment Facility Site*, UCID-20811, Lawrence Livermore National Laboratory, Livermore, California, 1986.
6. (US DOE, 1996) U.S. Department of Energy (US DOE), *Final Environmental Assessment Under DOE NEPA Regulations Decontamination and Waste Treatment Facility (DWTF)*, June 6, 1996.
7. (US DOE & UC, 1992) U.S. Department of Energy (US DOE) and University of California (UC), *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore*, Volumes 1 - 5, August 1992.
8. (Part B, 1996) U.S. Department of Energy and University of California, *Part B Permit Application for Hazardous Waste Treatment and Storage Facilities, Livermore Site*, Volumes 1-11, June 28, 1996 (revised March 1997, June 1997 and August 1997).

Table 1

Unit	Hazardous Waste Management Units	Current Status IS=interim status	Status After Permit Decision	Management Activity	Physical State (Solid, Liquid, Gas)	Storage Capacity (gallons)	Annual Treatment Capacity st=short ton=2000 lbs.
1	Building 280 Container Storage Unit	Proposed	Permit	Storage	Solid	135,700	
<b>Area 612 STUG</b>							
2	Area 612 Tank Trailer Storage Unit	IS	Permit	Storage	Solid or Liquid	5,000	
3	Area 612 Portable Tank Storage Unit	IS	Permit	Storage	Solid or Liquid	10,000	
4	Building 612 Container Storage Unit	IS	Permit	Storage	Solid or Liquid	7,150	
5	Building 612 Lab Packing Unit	IS	90-day <sup>s</sup> accumulation	Storage	Solid, Liquid, Gas	4,242	
6	Building 612 Drum/Container Crushing Unit	IS	Permit	Treatment	Solid		600 st/yr
7	Building 612 Size Reduction Unit	IS	Permit	Treatment	Solid		250 st/yr <sup>4</sup>
8	Area 612-1 Container Storage Unit	IS	Permit	Storage	Solid	287,244	
9	Area 612-2 Container Storage Unit	IS	Permit	Storage	Solid, Liquid	10,560	
10	Area 612-4 Receiving, Segregation & Container Storage Unit	IS	90-day <sup>s</sup> accumulation	Storage	Solid, Liquid, Gas	44,680	
11	Area 612-5 Container Storage Unit	IS	Permit	Storage	Solid	200,990	
12	Building 614 East Cells Container Storage Unit	IS	Permit	Storage	Solid, Liquid	3,520	
13	Building 614 West Cells Container Storage Unit	IS	Permit	Storage	Solid, Liquid	672	
14	Building 625 Container Storage Unit	IS	Permit	Storage	Solid, Liquid	42,416	
<b>Area 693 CSUG</b>							
15	Building 693 Container Storage Unit	IS w/ operating capacity of 84,470 gal	Permit w/ increased capacity	Storage	Solid, Liquid, Gas	141,240	
16	Building 693 Annex Classified Waste Storage	Proposed	Permit	Storage	Solid	22,880	
17	Building 693 Freezer Unit	Proposed	Permit	Storage	Liquid	30	
18	Building 693 Roll-Off Bin Storage	Proposed	Permit	Storage	Solid	16,200	

Table 1

Unit	Hazardous Waste Management Units	Current Status IS=interim status	Status After Permit Decision	Management Activity	Physical State (Solid, Liquid, Gas)	Storage Capacity (gallons)	Annual Treatment Capacity st=short ton=2000 lbs.
<b>Area 695 STUG</b>							
19	Building 695 Tank Farm	Proposed	Permit	Treatment and Storage	Liquid	45,000	325,000 gal/yr <sup>4</sup>
20	Building 695 Tank Blending Unit	IS	Permit relocated from 514	Treatment	Liquid		Included in #19 above
21	Building 695 Portable Blending Unit	IS	Permit relocated from 514	Treatment	Liquid		Included in #19 above
22	Building 695 Cold Vapor Evaporation Unit	IS	Permit relocated from 514	Treatment	Liquid		Included in #19 above
23	Building 695 Centrifuge Unit	IS	Permit relocated from 514	Treatment	Liquid		55,000 gal/yr <sup>4</sup>
24	Building 695 Solidification Unit	IS	Permit relocated from 514	Treatment	Solid, Liquid		115 st/yr <sup>4</sup>
25	Building 695 Shredding Unit	IS	Permit relocated from 514	Treatment	Solid		183 st/yr <sup>4</sup>
26	Building 695 Filtration Unit	Proposed	Permit	Treatment	Liquid		2,750 gal/yr <sup>4</sup>
27	Building 695 Drum Rinsing Unit	Proposed	Permit	Treatment	Solid		180 st/yr
28	Building 695 Debris Washer Unit	Proposed	Permit	Treatment	Solid		45 st/yr <sup>4</sup>
29	Building 695 Airlock Container Storage Unit	Proposed	Permit	Storage	Solid, Liquid, Gas	12,000	
30	Building 695 Reactive Waste Storage Unit	Proposed	Permit	Storage	Solid, Liquid	12,400	
31	DWTF Portable Tank Storage Pad	Proposed	Permit	Storage	Liquid	22,000	

Table 1

Unit	Hazardous Waste Management Units	Current Status IS=interim status	Status After Permit Decision	Management Activity	Physical State (Solid, Liquid, Gas)	Storage Capacity (gallons)	Annual Treatment Capacity st=short ton=2000 lbs.
32	Building 695 Reactive Waste Processing Area (RWP)	Proposed	Permit	Treatment	Solid, Liquid, Gas		0.09 st/day <sup>1</sup>
33	Building 695 Small Scale Treatment Laboratory (SSTL)	Proposed	Permit	Treatment	Solid, Liquid, Gas		0.28 st/day <sup>2</sup>
	SSTL/RWP Water Reactor	Proposed	Permit	Treatment	Solid, Liquid		0.09 st/day <sup>1,3</sup>
	SSTL/RWP Pressure Reactor	Proposed	Permit	Treatment	Solid, Liquid		0.09 st/day <sup>1,3</sup>
	SSTL Amalgamation Reactor (Treatment)	Proposed	Permit	Treatment	Liquid		0.09 st/day <sup>1,3</sup>
	RWP Uranium Bleaching Unit (Treatment)	Proposed	Permit	Treatment	Solid, Liquid		0.28 st/day
	Building 695 Gas Adsorption Unit (SSTL Treatment)	IS	Permit relocated from 514	Treatment	Gas		0.09 st/day
<b>Area 514 STUG</b>							
	B513 Solidification Unit	IS	relocate to B695	see unit #24 above			
	B513 Shredding Unit	IS	relocate to B695	see unit #25 above			
	A514-1 Cold Vapor Evaporation Unit	IS	relocate to B695	see unit #22 above			
	A514-1 Portable Blending Unit	IS	relocate to B695	see unit #21 above			
	A514-1 Tank Blending Unit	IS	relocate to B695	see unit #20 above			
	A514-1 Centrifuge Unit	IS	relocate to B695	see unit #23 above			

Table 1

Unit	Hazardous Waste Management Units	Current Status IS=interim status	Status After Permit Decision	Management Activity	Physical State (Solid, Liquid, Gas)	Storage Capacity (gallons)	Annual Treatment Capacity st=short ton=2000 lbs.
	A514-1 Gas Adsorption Unit	IS	relocate to B695	see Building 695 Gas Adsorption Unit under unit #33 above			
	B513 Container Storage Unit	IS	IS until Building 695 operable				
	B514 Silver Recovery Unit	IS	IS until Building 695 operable				
	B514 Waste Waster Filtration Unit	IS	IS until Building 695 operable				
	A514 Waste Water Treatment Plant	IS	IS until Building 695 operable				
	A514 Quadruple Tank System	IS	IS until Building 695 operable				
	A514-1 Container Storage Unit	IS	IS until Building 695 operable				
	A514-2 Container Storage Unit	IS	IS until Building 695 operable				
	A514-3 Container Storage Unit	IS	IS until Building 695 operable				
	Building 233 Container Storage Unit	IS	IS until Building 280 operable				

- 1 - Small-scale treatment processes may be conducted in reactive waste processing area glove boxes.
- 2 - The maximum collective throughput of all SSTL units is 0.28 short tons (250 kg) per day.
- 3 - Water reactor, pressure reactor and amalgamation reactors are each limited to 0.09 st/day throughput.
- 4 - Baseline operating capacity from February 1997 Health Risk Assessment.
- 5 - Converting to 90-day generator accumulation area and will undergo closure when final closure of Building 612 is performed.

**TABLE 2**

**TONS PER YEAR OF CRITERIA POLLUTANT EMISSIONS FOR  
LLNL, ALAMEDA COUNTY AND SAN FRANCISCO BAY AREA BASIN**

Criteria Pollutant	Sitewide		Proposed Project	Alameda County <sup>(5)</sup> 1995	San Francisco Bay Area Basin <sup>(5)</sup> 1995
	1995 <sup>(1)</sup>	1996 <sup>(2)</sup>			
Carbon Monoxide	2.3	2.4	0.12 <sup>(3)</sup>	713	3462
Nitrogen Dioxide	13.4	13.9	0.24 <sup>(3)</sup>	110	560
Particulate Matter of 10 microns or less (PM <sub>10</sub> )	2.0	1.32	0.03 <sup>(3)</sup>	10	49
Sulfur Dioxide	0.17	0.19	0 <sup>(3)</sup>	8	81
Precursor Organic Compounds	6	7.2	0.09 <sup>(4)</sup>	222	900
<p>(1) Source: Environmental Report for 1995, LLNL (UCRL 50027-95). Emission rates converted from kg/d to tons/yr assuming 220 days of operation in one year.</p> <p>(2) Source: Environmental Report for 1996, LLNL (UCRL 50027-96). Emission rates converted from kg/d to tons/yr assuming 220 days of operation in one year.</p> <p>(3) Source: Final Environmental Assessment under DOE NEPA Regulations, Mixed Waste Management Facility, LLNL, DOE/EA-1089.</p> <p>(4) Value based on a 95% efficiency of carbon adsorption system and 220 days of operation in one year.</p> <p>(5) Source: Bay Area Air Quality Emissions Inventory</p>					

TABLE 3

ESTIMATED EMISSIONS OF HAZARDOUS AIR POLLUTANTS

Hazardous Air Pollutant	Sitewide				Proposed Project	Standard
	1990	1992	1995	1996		
Radionuclide	0.240 mrem/y <sup>(1)</sup>	0.079 mrem/y <sup>(1)</sup>	0.041 mrem/y <sup>(1)</sup>	0.093 mrem/y <sup>(1)</sup>	0.084 mrem/y <sup>(2)</sup>	10 mrem/y (40 CFR 61.92)
Mercury <sup>(3)</sup>	N/A	N/A	N/A	N/A	9 mg/y <sup>(4)</sup>	2300 g/24-hour period <sup>(5)</sup> (40 CFR 61.52)
Beryllium	89 pg/m <sup>3(6)</sup>	N/A	N/A	43.4 pg/m <sup>3(7)</sup>	(DWTF) <sup>(8)</sup> 6.3 x 10 <sup>-6</sup> pg/m <sup>3</sup>  (A612) <sup>(8)</sup> 1.9 x 10 <sup>-6</sup> pg/m <sup>3</sup>	10,000 pg/m <sup>3</sup> , monthly max. (40 CFR 61.32)
<p>(1) Source: LLNL NESHAPs 1996 Annual Report, LLNL (UCRL-ID-113867-97)</p> <p>(2) Source: Health Risk Assessment for Hazardous &amp; Mixed Waste Management Units at LLNL, Feb. 1997, (UCRL-AR-119482-97 rev. 1). Note: Does is equal to the sum of dose from B612 operations to the associated MEI (0.041 mrem/y) plus the dose from DWTF operations to the associated MEI (0.043 mrem/y). Since these MEIs are in different locations, the actual dose received by any one individual off-site would be less than the sum (0.084 mrem/y).</p> <p>(3) LLNL has no operations for which mercury standards exists. LLNL does not conduct any ambient air monitoring for mercury.</p> <p>(4) Standard is only applicable to emissions from mercury ore processing facilities and is only provided for comparison purposes.</p> <p>(5) Source: Final Environmental Assessment for the Decontamination &amp; Waste Treatment Facility, June 6, 1996, DOE/EA-1150, p. A-23.</p> <p>(6) Source: Final EIR/EIR for Continued Operation of LLNL and SNL, August 1992, US DOE &amp; UC, p. 4-124.</p> <p>(7) Source: Environmental Report for 1996, LLNL (UCRL 50027-96)</p> <p>(8) Calculated from data found in Health Risk Assessment for Hazardous and Mixed Waste Management Units at LLNL, Feb. 1997.</p>						

TABLE 4

Effluent Pollutant Limitations from LLNL's 1996-1997 Wastewater Discharge Permit

Pollutant	Limit (mg/L unless noted)
pH	5 -10 (unitless)
Oil and grease	100
Cyanide (CN)	0.04
Total Toxic Organics (TTO)	1.0
Silver (Ag)	0.2
Arsenic (As)	0.06
Cadmium (Cd)	0.14
Chromium (Cr)	0.62
Copper (Cu)	1.0
Mercury (Hg)	0.01
Nickel (Ni)	0.61
Lead (Pb)	0.2
Zinc (Zn)	3.0
Tritium	$10,000 \times 10^{-6} \mu\text{Ci/mL}^{(a,b)}$
Cesium-137	$1,000,000 \times 10^{-11} \mu\text{Ci/mL}^{(a)}$ $1,500,000 \times 10^{-11} \mu\text{Ci/mL}^{(b)}$
Plutonium-239 (soluble)	$200,000 \times 10^{-12} \mu\text{Ci/mL}^{(a)}$ $150,000 \times 10^{-12} \mu\text{Ci/mL}^{(b)}$
Plutonium-239 (insoluble)	$10,000,000 \times 10^{-12} \mu\text{Ci/mL}^{(b)}$
<sup>(a)</sup> 10CFR monthly limit <sup>(b)</sup> DOE monthly limit for Best Available Technology (BAT). These effluent limits apply to facilities discharging to a POTW.	

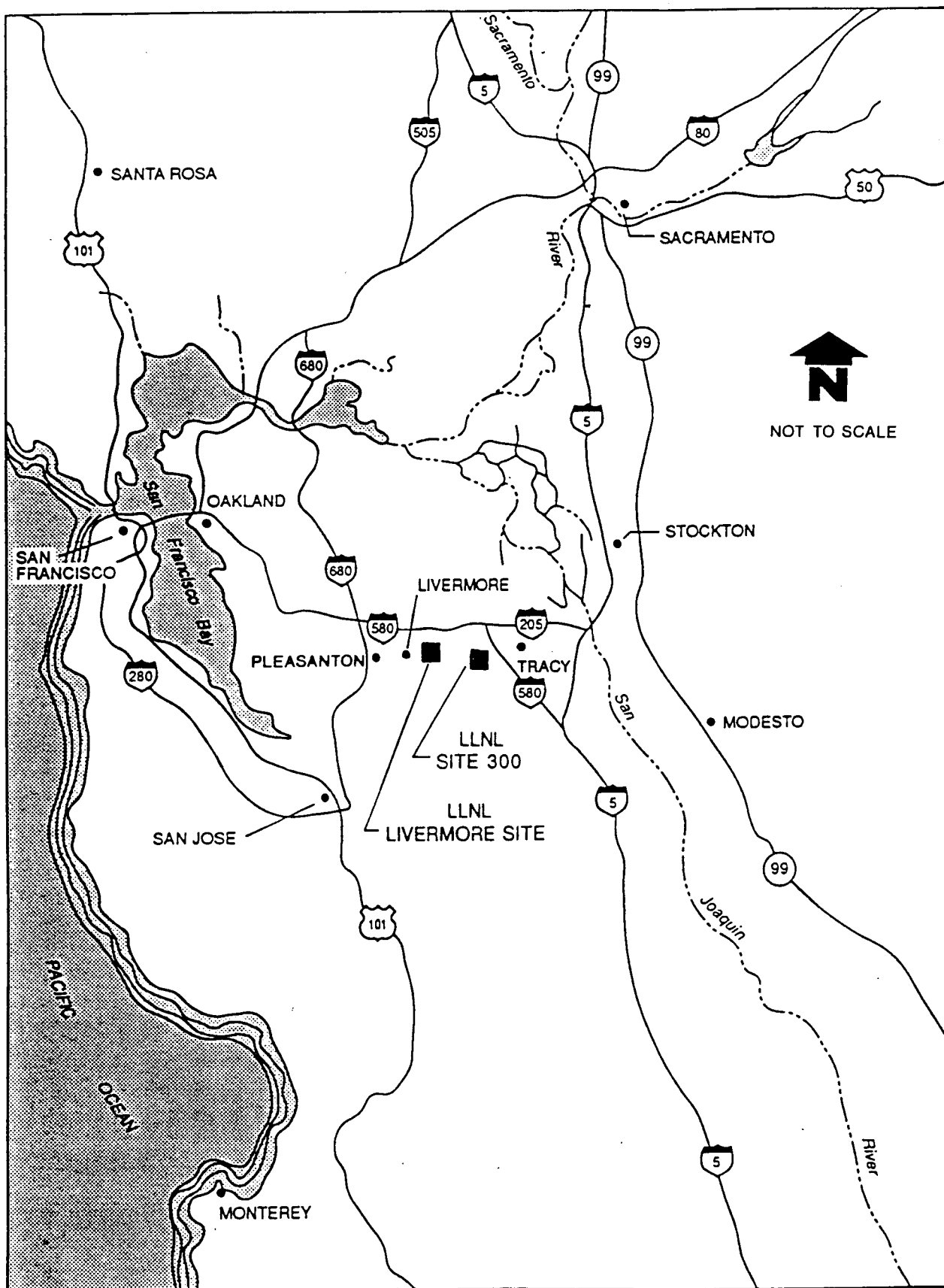


FIGURE 1: Regional location of the LLNL Livermore site and Site 300

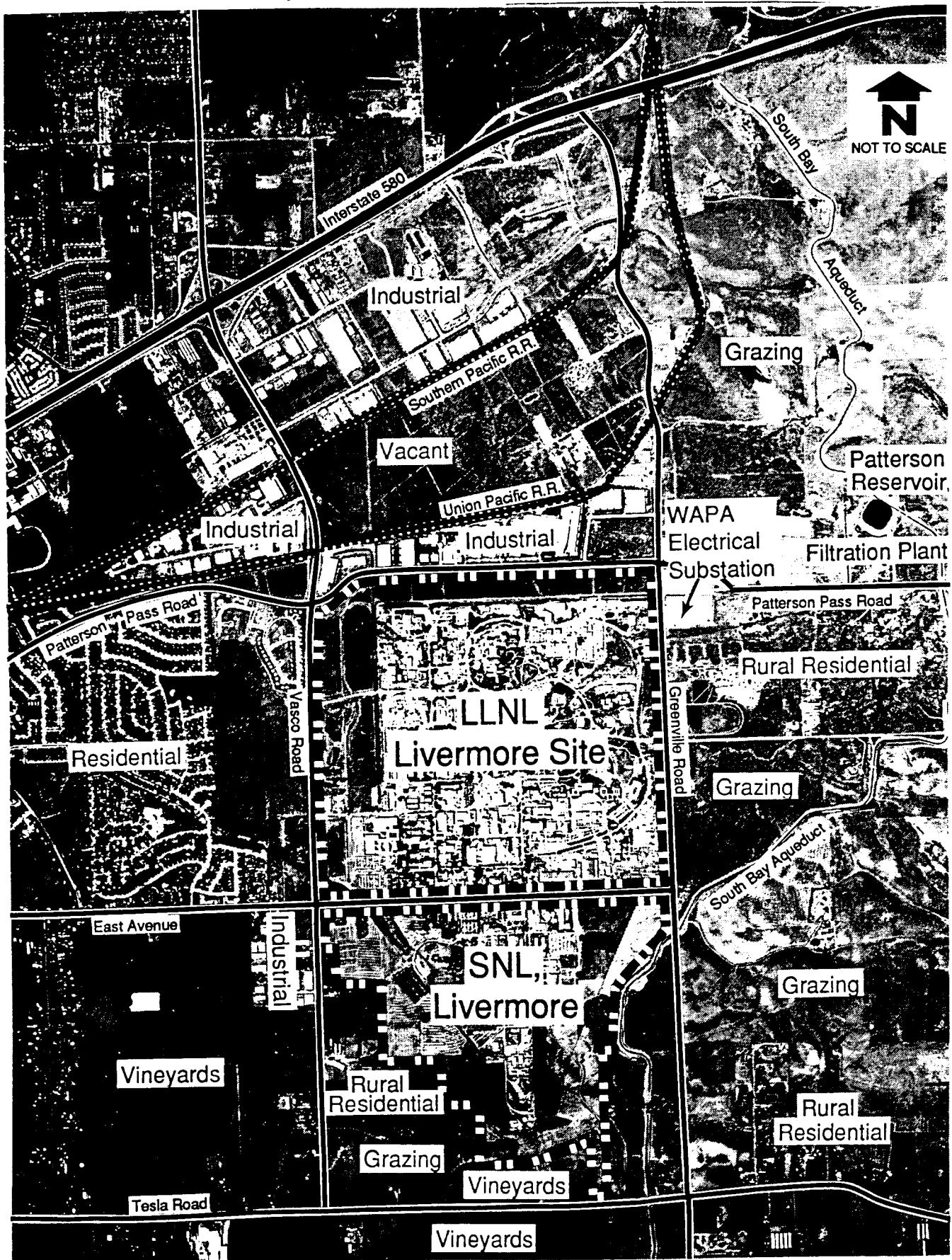


FIGURE 2: Surrounding land uses at the LLNL Livermore Site

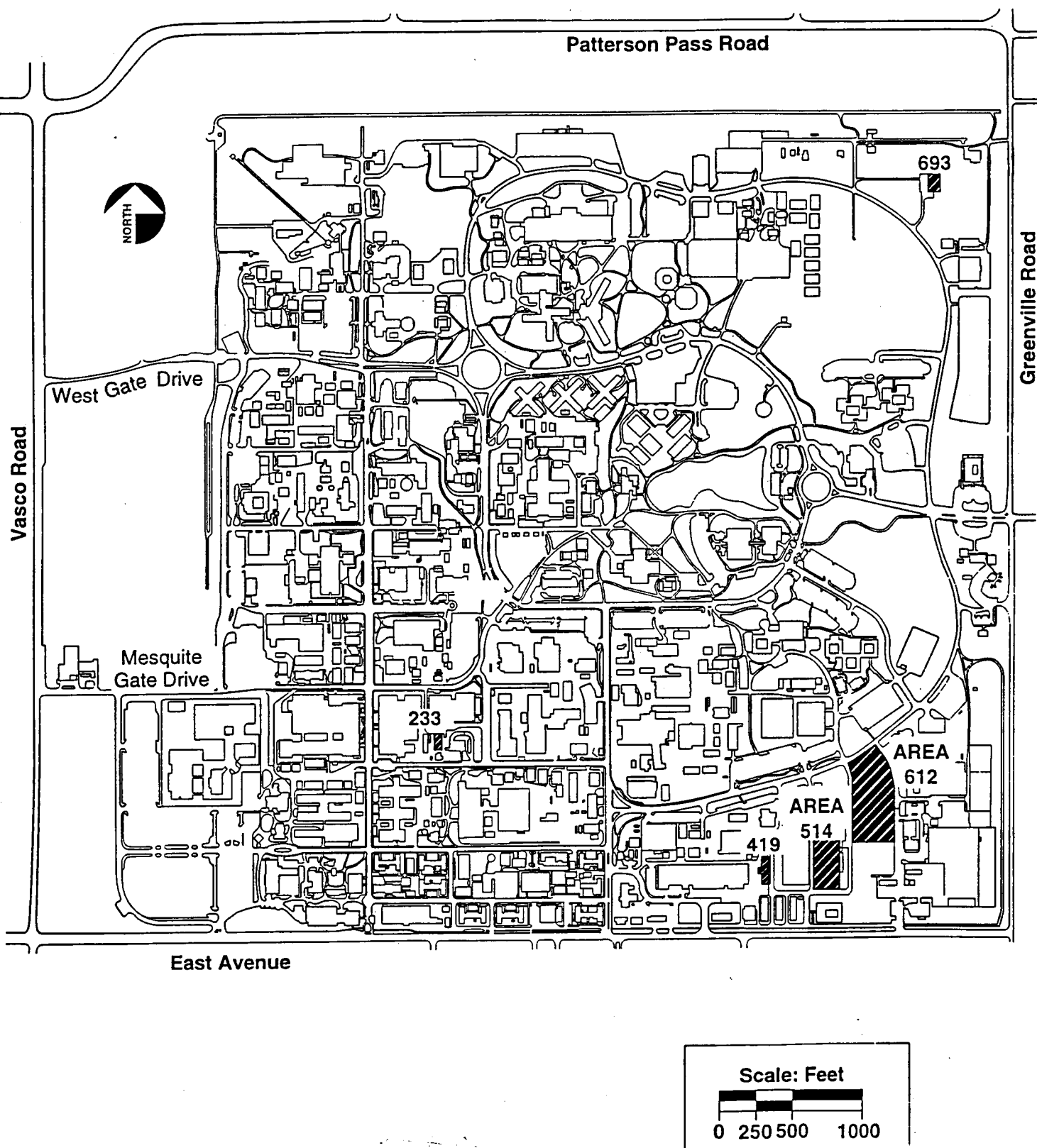


FIGURE 3: LLNL's existing hazardous waste treatment and storage areas under interim status

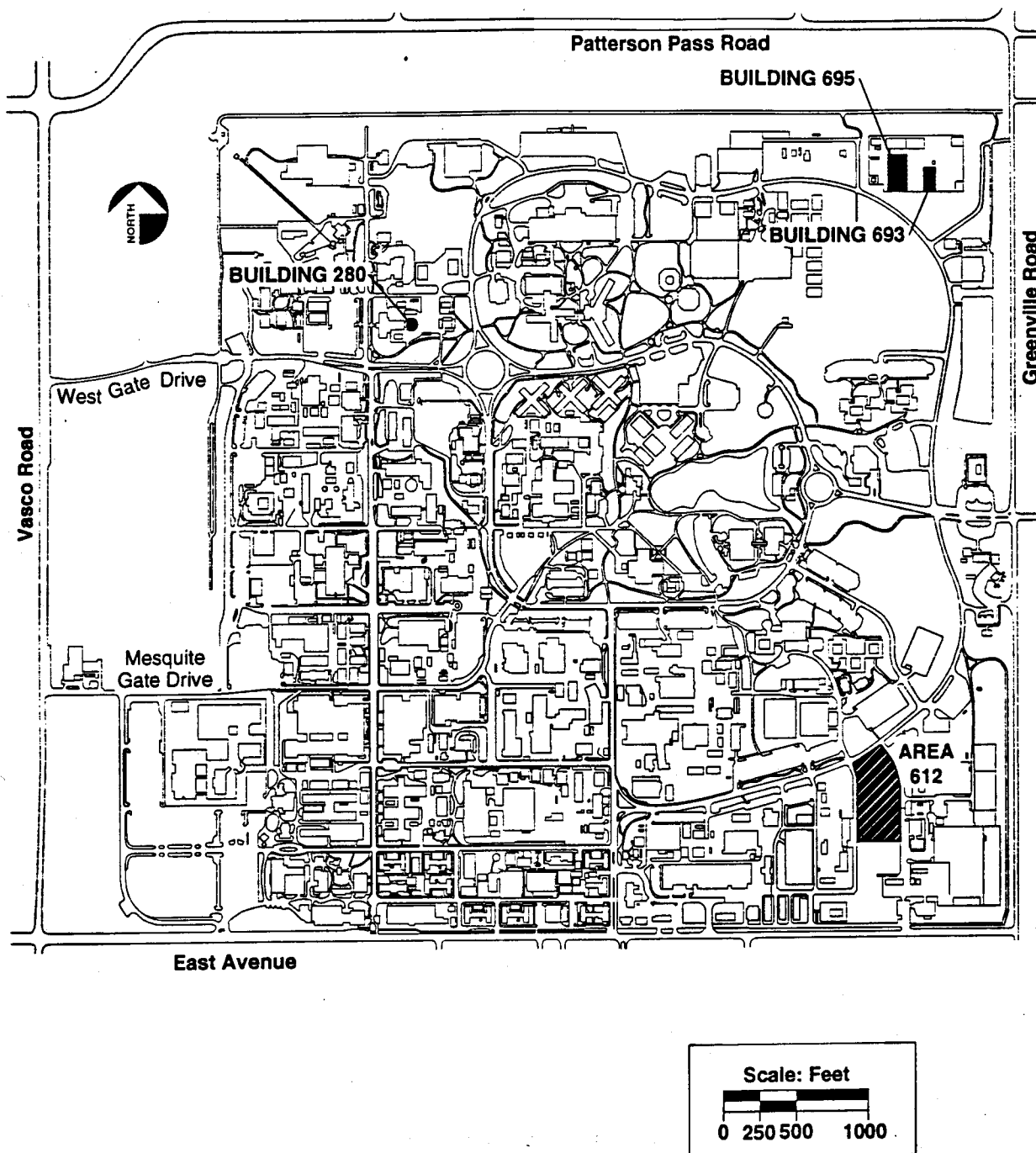


FIGURE 4: LLNL's proposed hazardous waste treatment and storage areas

Boxes stacked two-high  
equal 54 drums stacked two-high  
with four pallets.

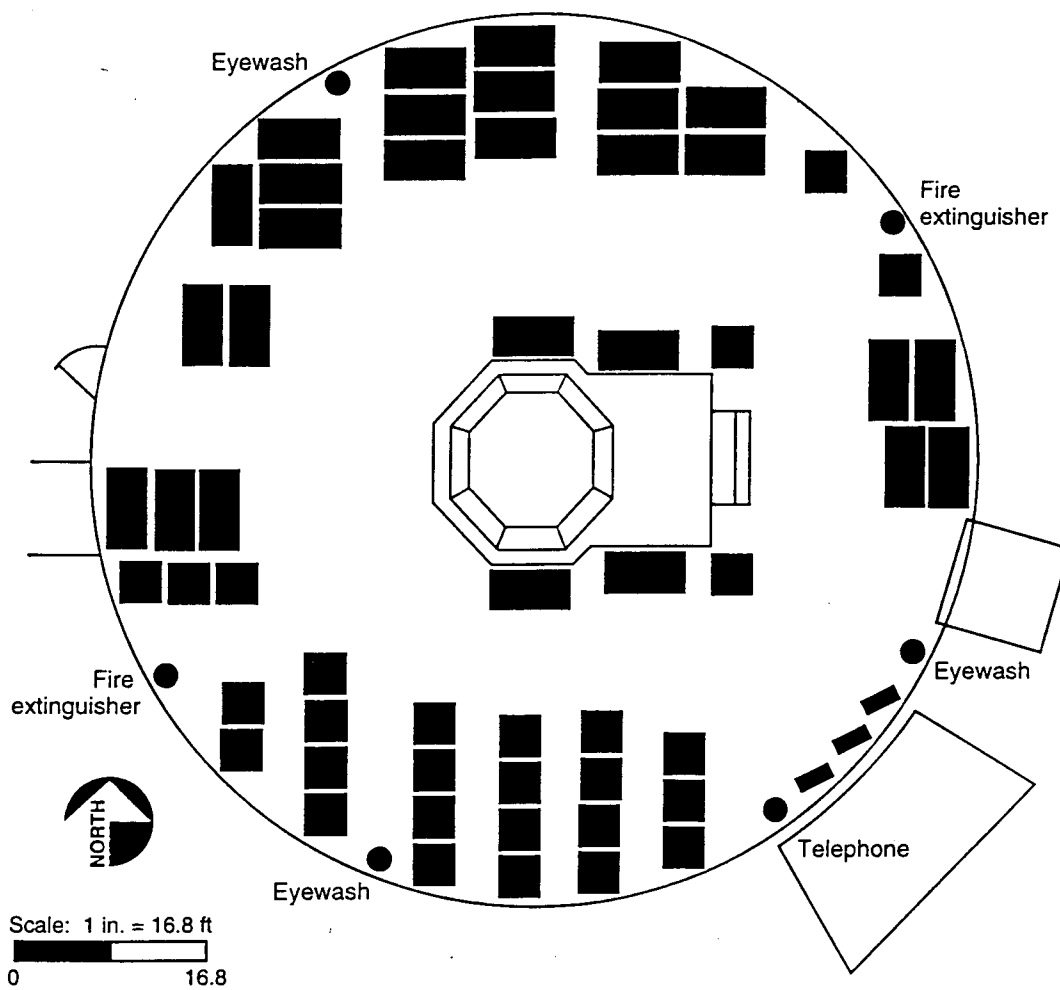


FIGURE 5: Typical container arrangement for the Building 280 Container Storage Unit

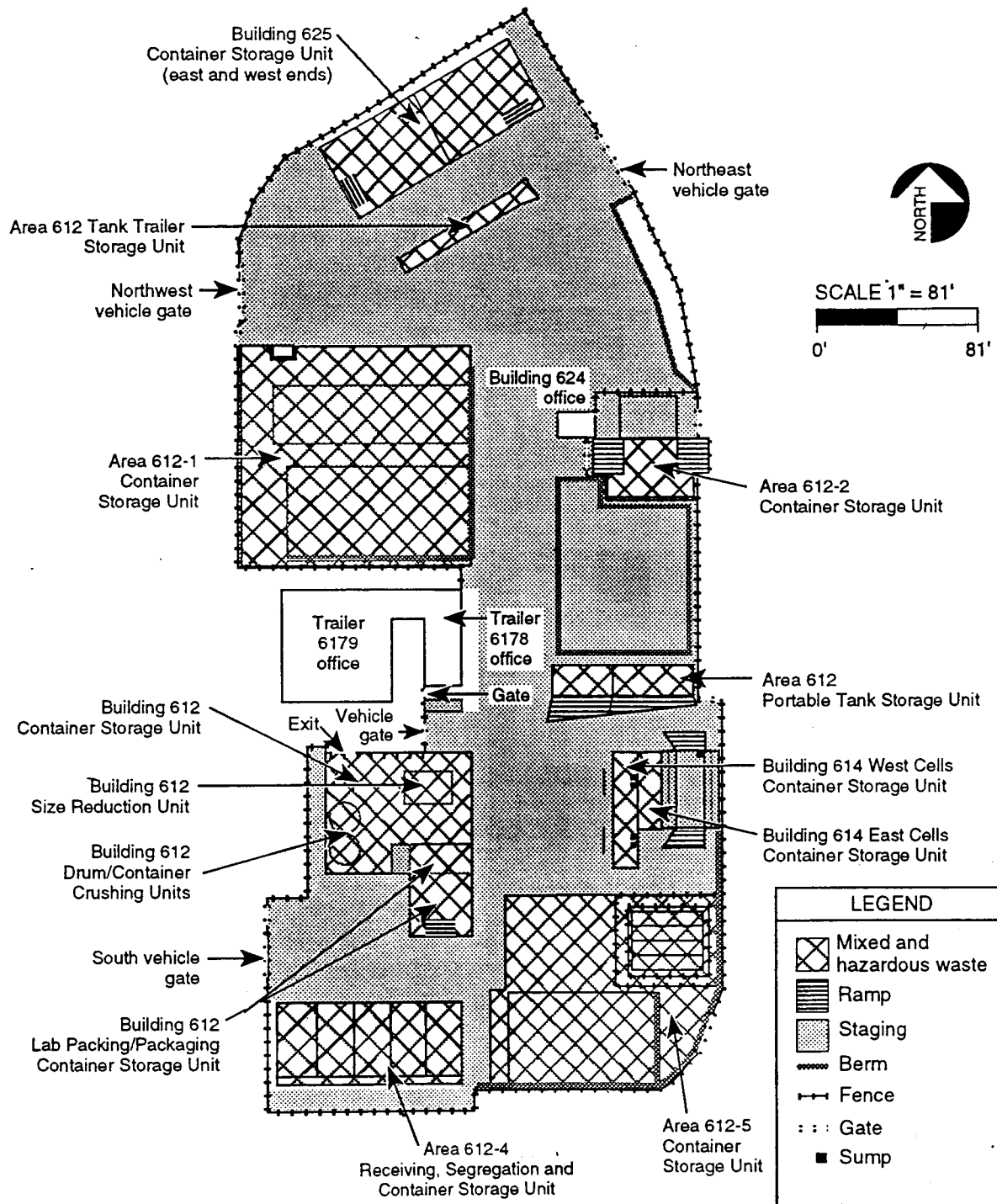


FIGURE 6: Layout of Area 612 Container Storage/Treatment Unit Group

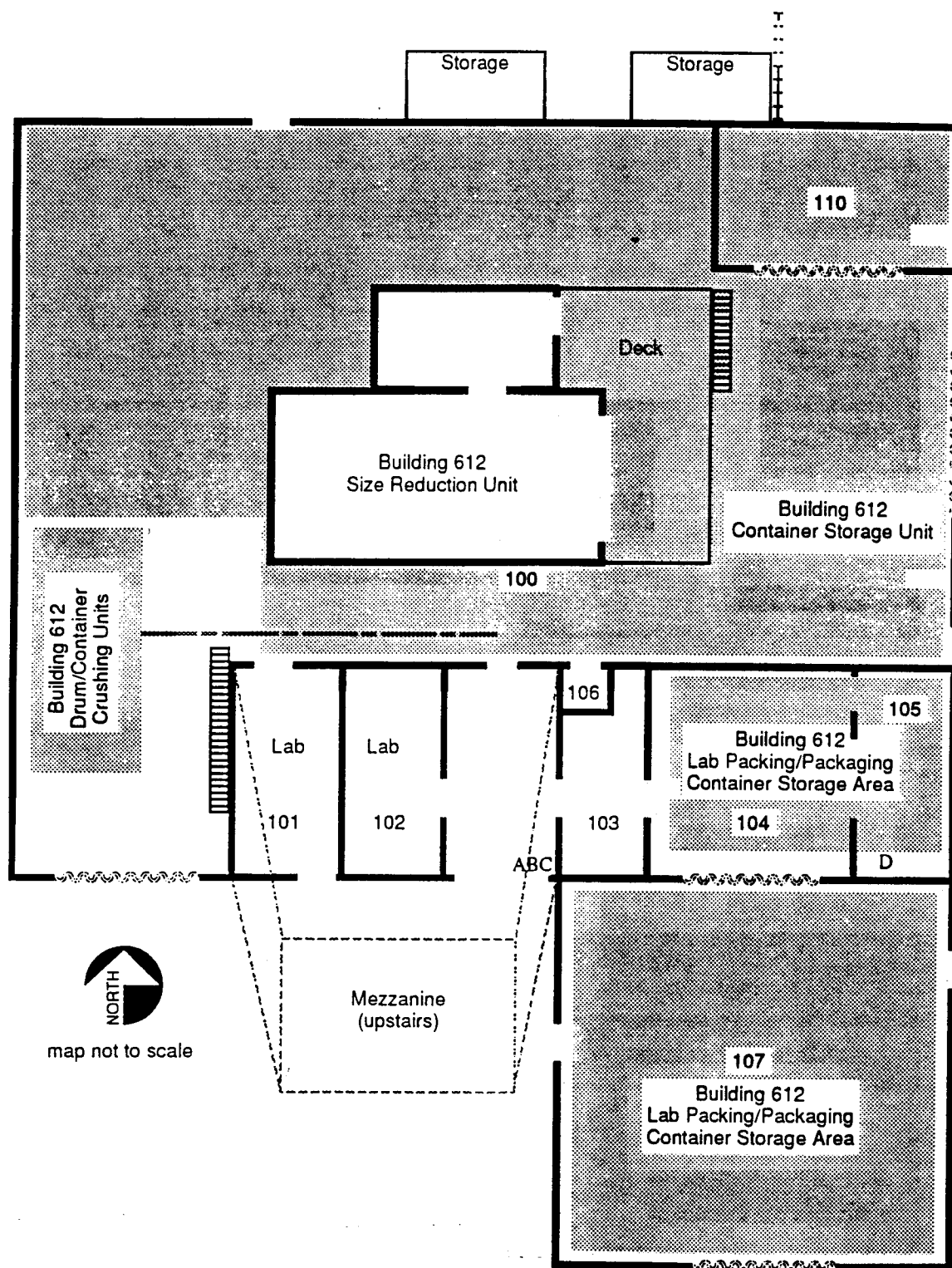


FIGURE 7: Floor plan of Building 612

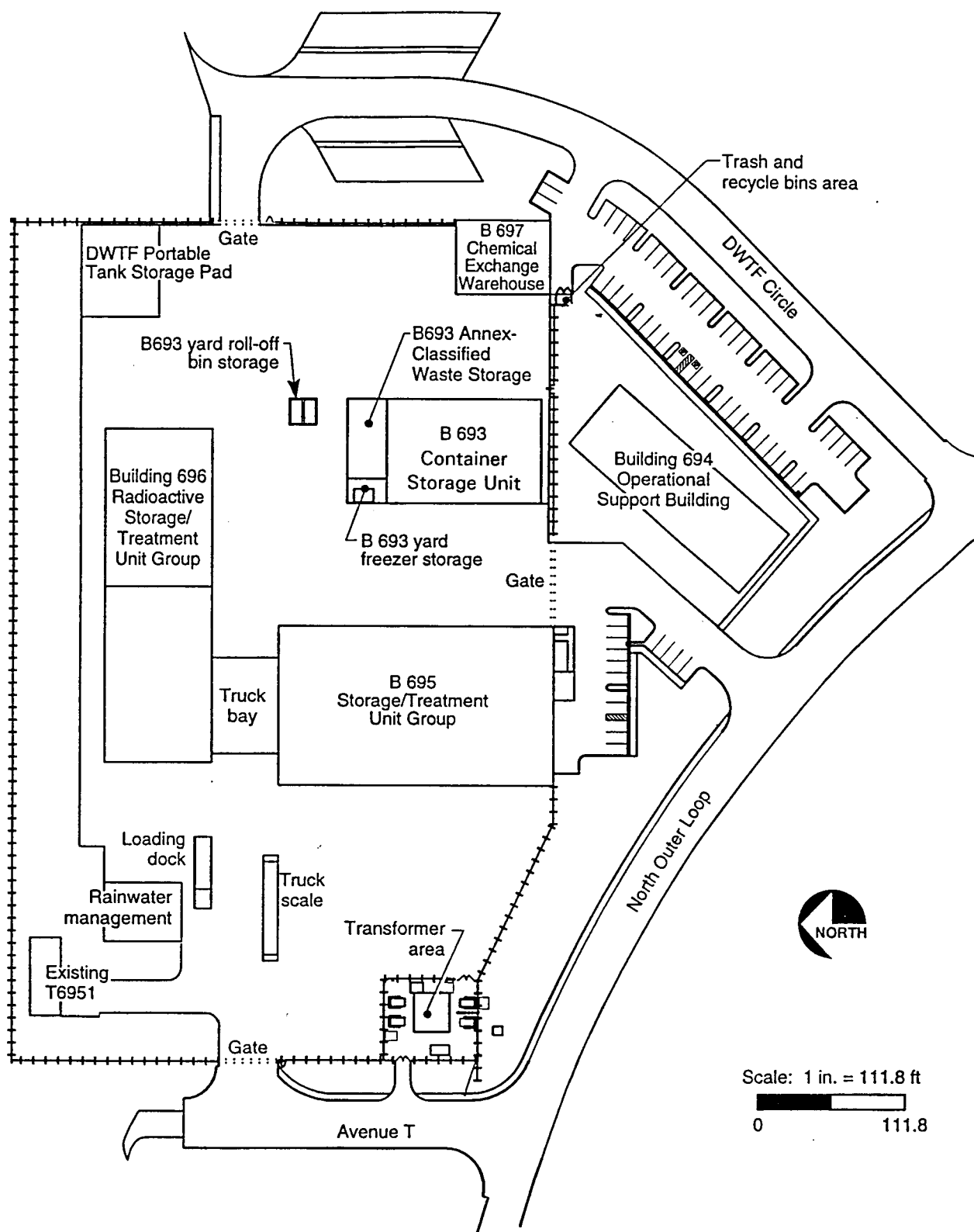


FIGURE 8: Location of Building 693 Storage/Treatment Unit Group within DTWF Complex

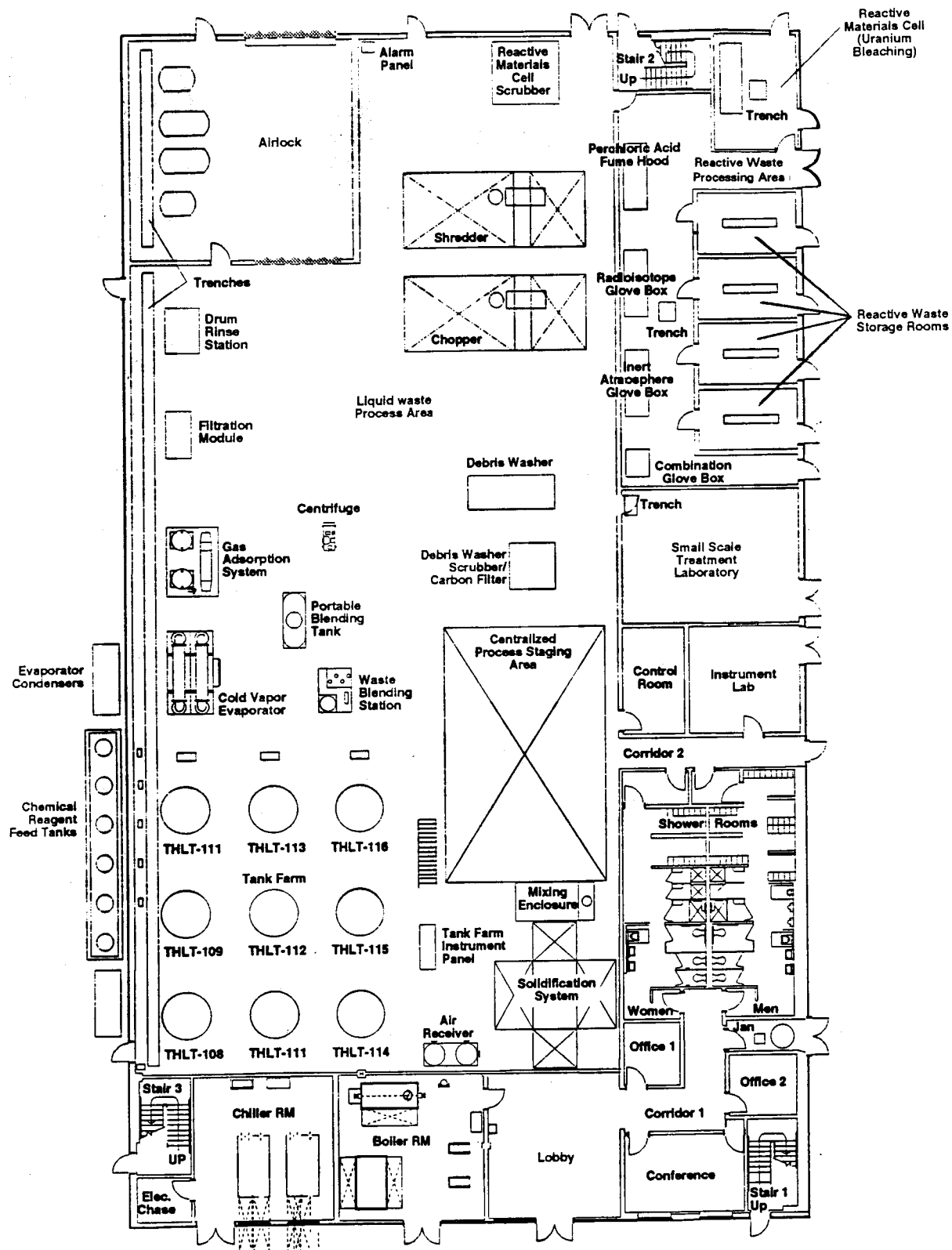


FIGURE 9: Layout of Building 695 Storage/Treatment Unit Group